STATE OF CALIFORNIA

The Resources Agency

Department of Water Resources

BULLETIN No. 177-68

WATERMASTER SERVICE IN NORTHERN CALIFORNIA

1968 SEASON

AUGUST 1969

NORMAN B. LIVERMORE, JR.
Secretary for Resources
The Resources Agency

RONALD REAGAN
Governor
State of California

WILLIAM R. GIANELLI
Director
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FOREWORD

Bulletin No. 177-68 discusses the watermaster service provided by the Department of Water Resources to areas in Northern California during the 1968 watermaster season. Authority to prepare this report is described in the California Water Code, Division 2, Part 4, Chapter 7.

The bulletin is presented in two parts. Part I contains general information about water rights, water supply, service areas, and watermaster duties. Part II contains the specifics of the 1968 watermaster season, including the streamflow in the various service areas, the methods of distribution, and all other information pertinent to 1968 watermaster activities.

William R. Gianelli

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The Resources Agency
State of California
July 22, 1969

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES

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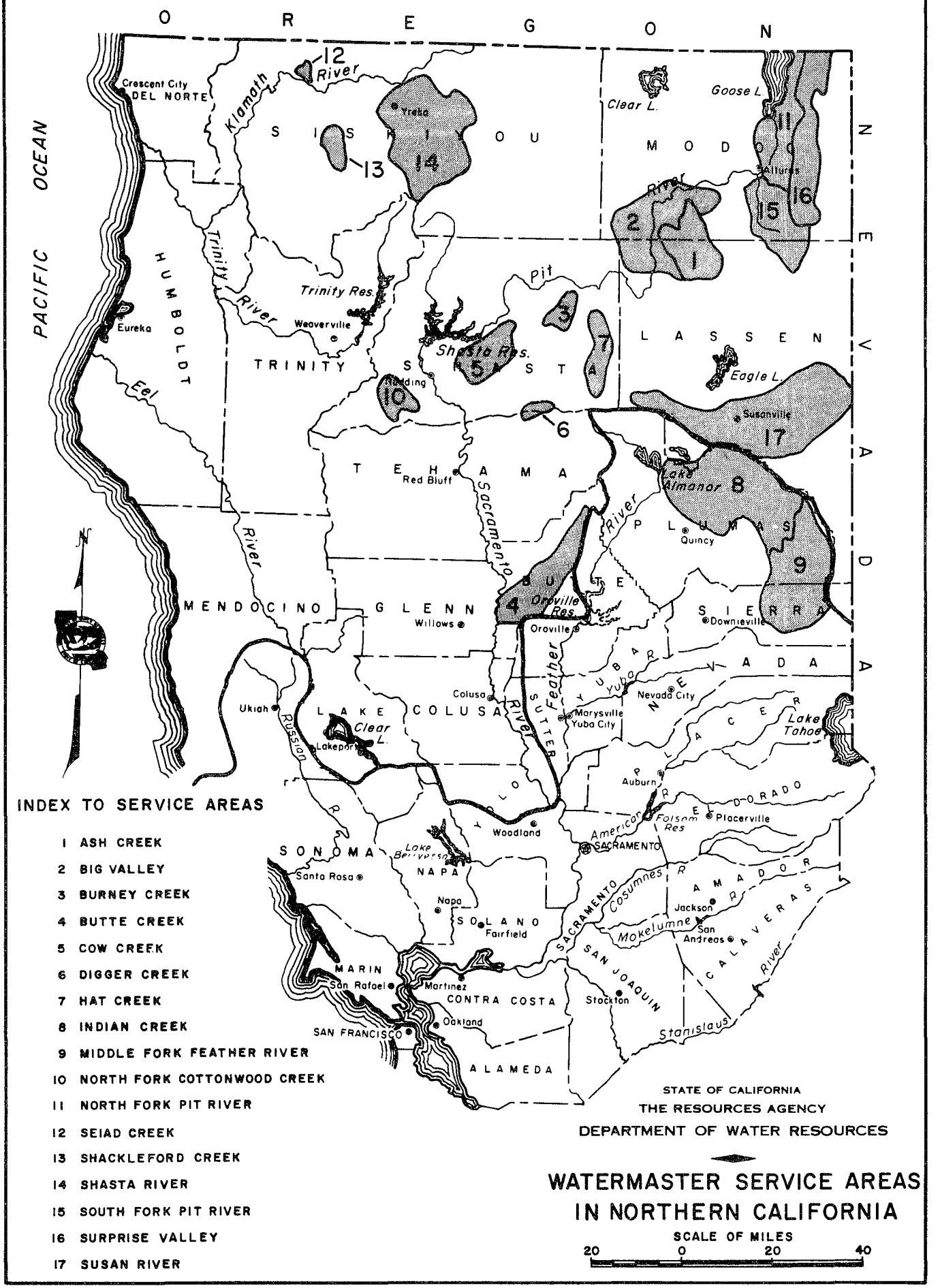
ABSTRACT

The primary purpose of watermaster service is to distribute water among users in accordance with their established water rights. This is accomplished by apportioning available supplies in streams which have had water rights determinations.

Watermaster service was provided by the Department of Water Resources to 16 areas in Northern California during the 1968 watermaster season. They are: Ash Creek, Big Valley, Burney Creek, Butte Creek, Cow Creek, Digger Creek, Hat Creek, Indian Creek, Middle Fork Feather River, North Fork Cottonwood Creek, North Fork Pit River, Shackleford Creek, Shasta River, South Fork Pit River, Surprise Valley, and Susan River.

Drought or near drought conditions existed in essentially all of these areas during the 1968 irrigation season, as the streamflows throughout Northern California were far below the long-term average.

The bulletin is presented in two parts. Part I contains general information about water rights, water supply, and watermaster areas and duties. Part II contains specific information for each service area during the 1968 watermaster season, including available streamflow, methods and amounts of water distribution, and all other information pertinent to 1968 watermaster activities.



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STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATERMASTER SERVICE AREAS IN NORTHERN CALIFORNIA

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PART I - GENERAL INFORMATION

Distribution of water in watermaster service areas is a continuing statutory function of the Department of Water Resources as provided in Part 4 of Division 2 of the California Water Code.

The primary purpose of watermaster service is to distribute water in accordance with established water rights. This is accomplished by apportioning available supplies in streams which have had water right determinations.

A major benefit of watermaster service to water users and the State is that court litigation and physical violence, which in past years occurred quite frequently, are essentially eliminated. Under watermaster service each water right owner is assured that his rights are being protected without his having to take legal action against other users. Another important benefit results from increased use of available supplies through reduction of wasted water.

Because both the water right owners and the State receive benefits from watermaster service, the costs of performing the service are shared. The State general tax fund pays for one-half the cost of operating each service area. The water right owners in the service area pay the other one-half.

Determination of Water Rights

Water rights determinations for purposes of establishing a watermaster service area may be accomplished by "statutory" adjudication, "court" adjudication, permit or license to appropriate, or by agreement.

The California Water Code (Sections 2500-2900) contains procedures whereby water users on any stream may petition to have the State Water Resources Control Board, Division of Water Rights, make a legal determination of water rights on that stream. If the Board finds that such a determination is in the public interest, it proceeds with a Statutory Adjudication. This adjudication ultimately results in a court decree which defines all water rights on the stream.

A similar but less extensive method of defining water rights involves a "court" adjudication procedure. When an action is brought before the Superior Court in the county in which there is a water rights dispute, the court has two methods available for its settlement. It may refer the action to the State Water Resources Control Board for a determination under authority contained in Sections 2000-2076 of the Water Code. Or, it may make an investigation of the facts and render a decision without referral to the Board.

These court adjudications determine only the water rights of parties named in the action and therefore do not necessarily define all water rights on the stream. Consequently, they sometimes precipitate serious conflicts between decreed water right owners and persons claiming rights for riparian lands which were not considered in the decree.

Almost all of the streams under state watermaster service have had their water rights defined by the courts under one of the above adjudication procedures. These adjudications (decrees) establish each owner's rights as to allowable rate of diversion, season of use, point of diversion, and place of use. They also establish priorities whereby each owner's rights are shown in relation

to the rights of all other decreed owners.

Under the priority system all first priority rights must be fully satisfied before water can be diverted to any lower priority rights (second, third, etc.). When a shortage occurs within any priority, the available water is proportioned among all owners of that priority.

Description of Watermaster Service Areas

A watermaster service area may be created either by petition from water users (Section 4050 of the Water Code) or by order of a Superior Court.

The first watermaster service areas were created in September 1929, while the most recent addition was made in June 1964. Prior to 1929, some watermaster service was provided in accordance with the Water Commission Act of 1913. There are now about 50 streams in Northern California which are under state watermaster service. These are combined into the 17 service areas shown on Figure 1. Fifteen are in the Northern District and two are in the Central District. The Seiad Creek service area is presently inactive.

The service areas are located primarily in the mountainous northeastern part of the State where the growing season varies between about 100 and 140 days. Meadow hay and alfalfa are the principal crops under irrigation, although a considerable amount of land is used exclusively for pasturing livestock. Most irrigation is accomplished by gravity systems, with water users diverting directly from the streams at one or more diversion points. However, pumped diversions and sprinkler irrigation systems are becoming popular in some areas.

Table 1 lists all watermaster service areas in Northern California, the date each was created, and the corresponding decrees and agreement under which each is operated.

Schematic drawings of the major stream systems within each service area are presented in Figures 2 through 17. These drawings show the relative location of major roads, stream gaging stations, diversion points, and water right allotments for each diversion. The diversion points shown in these figures correspond to those listed in the respective decrees which define the water rights.

Watermaster Responsibilities

To assure the proper distribution of water within his service area, each watermaster must ascertain the amount of water available and distribute it both by amount and priority in accordance with established water rights. To accomplish his purposes, the watermaster is provided authority both by the Water Code and by provisions of pertinent court decrees or voluntary agreements, to physically regulate the various streams in a service area. He is further authorized to supervise the design, construction, operation and maintenance of diversion dams, headgates, and measuring devices.

Each watermaster supervises water distribution at approximately 100 to 200 diversions in one or more service areas. The frequency of visiting these diversion points substantially increases in years of short water supply.

Permanent measurement and control devices, which the State requires at each owner's main point of diversion, are constructed by the water users under supervision of the watermaster. Installation of accurate, easily set, and lockable structures is a continuing objective of watermaster service, since once they are built, conflicts among water users almost always stop. Also, the watermaster's ability to visit and set each diversion on a regular basis is greatly facilitated by good structures.

TABLE 1

SUPERIOR COURT DECREES REGULATING WATER DISTRIBUTION

Watermaster Service Area	Name of Stream System	County	Decree Number	Decree Date	Decree Type*	Date Watermaster Service Area Created	Remarks
Ash Creek	Ash Creek	Modoc ** and Lassen	3670	10-27-47	CR	4-03-59	Included as part of Big Valley service area 1949 through 1958.
Big Valley	Pit River	Modoc ** and Lassen	6395	2-17-59	S	11-13-34	Service provided in accordance with recorded agreement in 1934. Service area operated under recorded agreement 1935 through 1958, and under decree since 1959.
Burney Creek	Burney Creek	Shasta	5111	1-30-26	CR	9-11-29	Service provided in accordance with decree since 1926.
Butte Creek	Butte Creek	Butte	18917	11-06-42	S	1-07-43	
Cow Creek	North Cow Creek	Shasta	5804	4-29-32	CR	10-17-32	
	Oak Run Creek	Shasta	5701	7-22-32	CR	10-17-32	
	Clover Creek	Shasta	6904	10-04-37	CR	1-21-38	Included in Cow Creek service area.
Digger Creek	Digger Creek	Shasta and Tehama **	2213	8-12-99	C	6-11-64	
			3214	5-27-13	C		
			3327	10-16-17	C		
			4570	2-24-27	C		
Hat Creek	Hat Creek	Shasta	5724	5-14-24	CR	9-11-29	Service provided in accordance with decree since 1924.
			7858	10-07-35	CR		
Indian Creek	Indian Creek	Plumas	4185	5-19-50	S	2-19-51	
Middle Fork Feather River	Middle Fork Feather River	Plumas ** and Sierra	3095	1-22-40	S	3-29-40	
North Fork Cottonwood Creek	North Fork Cottonwood Creek	Shasta	5479	6-09-20	CR	9-11-29	Service provided intermittently in accordance with the decree since 1924.
North Fork Pit River	North Fork Pit River and all tributaries except Franklin Creek	Modoc	4074	12-14-39	S	12-18-39	All stream systems consolidated into North Fork Pit River service area 12-13-40.
	New Pine Creek	Modoc	2821	6-14-32	CR	6-22-32	
	Davis Creek	Modoc	2782	6-30-32	CR	7-13-32	
	Franklin Creek	Modoc	3118	9-08-33	CR	9-14-33	
	Cottonwood Creek	Modoc	2344	5-03-40	CR	12-13-40	
Seiad Creek	Seiad Creek	Siskiyou	13774	4-10-50	S	11-06-50	Service provided in accordance with decree by order of the court in 1950. Service suspended since September 1964.
Shackleford Creek	Shackleford Creek	Siskiyou	13775	4-10-50	S	11-06-50	Service provided in accordance with decree by order of the court in 1950.
Shasta River	Shasta River	Siskiyou	7035	12-29-32	S	3-01-33	
South Fork Pit River	South Fork Pit River	Modoc ** and Lassen	3273	10-30-34	CR	12-31-34	Service includes operation of West Valley Reservoir (built subsequent to issuance of decree) in accordance with the demands of South Fork Irrigation District.
	Pine Creek	Modoc	Agreement	11-22-33		1-12-35	
Surprise Valley	Cedar Creek	Modoc	1206	5-22-01	C	9-11-29	All adjudicated stream systems in Surprise Valley were consolidated into the Surprise Valley service area on 1-10-39. Bidwell Creek was added on March 16, 1960. Service started on Cedar Creek in 1926 in accordance with the decree. Service was provided on Soldier and Owl Creeks in 1929 in accordance with the decrees by order of the court.
			2343	2-15-23	C		
	Soldier Creek	Modoc	2405	11-28-28	CR	9-11-29	
	Owl Creek	Modoc	2410	4-29-29	CR	9-11-29	
	Emerson Creek	Modoc	2840	3-25-30	CR	4-02-03	
	Mill Creek	Modoc	3024	12-19-31	CR	12-30-31	
	Deep Creek	Modoc	3101	1-25-34	CR	12-29-34	
	Pine Creek	Modoc	3391	12-07-36	CR	1-13-37	
	Rader Creek	Modoc	3626	6-04-37	CR	6-12-37	
	Eagle Creek	Modoc	2304	4-05-26	C	1-10-39	
			3284	11-05-37	CR		
	Bidwell Creek	Modoc	6420	1-13-60	S	3-16-60	
Susan River	Susan River	Lassen	4573	4-18-40	CR	11-10-41	
	Baxter Creek	Lassen	8174	12-15-55	S	2-16-56	
	Parker Creek	Lassen	8175	12-15-55	S	2-16-56	

* Explanation of type of Decree:
C Court adjudication (court makes determination from evidence submitted - no report of referee)
CR Court adjudication (referred to State Water Resources Control Board for investigation and report)
S Statutory adjudication (State Water Resources Control Board is petitioned by water users to make a determination of all water rights on a stream system)

** Decree entered by the Superior Court of this county

The watermaster is often called upon to make immediate field or on-the-spot interpretations of various court decrees, agreements, etc. Since most of these documents were written more than 30 years ago, many situations have developed that were not initially considered. Therefore, the watermaster must use sound, careful, and practical judgment in attempting to reach workable solutions to water disputes. To accomplish this he must possess a good understanding of California Water Law.

Water Supply

Water supply in the watermaster service areas is derived principally from unregulated runoff of small streams. Peak runoff, mostly snowmelt, occurs in the spring, with relatively small streamflow occurring in the summer and early fall. Additional supplies from storage reservoirs and ground water pumping are used in some areas to supplement natural streamflow.

In some service areas the water supply must be predicted in advance to determine the date watermastering will begin and, to some extent, the manpower needed. The Department's Bulletin No. 120 series, "Water Conditions in California", is used to assist in these predictions.

Precipitation

The streamflow available for distribution is affected by total precipitation, amount of snowpack, air temperature, and the amount of rainfall received during the irrigation season. The latter is particularly important in the Upper Pit River-Surprise Valley areas, where about 25 to 30 percent of the annual precipitation occurs in April, May and June. Spring storms, which are normally accompanied by cooler temperatures, materially affect both the supply and the demand for water.

Temperatures in the spring affect the demand for water and the manner in which snowmelt runoff occurs. A hot, dry spring depletes the water supply very early, even in years of normal snowpack. A cold, wet spring can extend the supply well into the irrigation season, but cold temperatures retard the growth of crops and are not necessarily desirable.

Data collected at representative snow courses showing the snowpack as of April 1 and May 1, 1968, are presented in Table 2. This information was obtained from the Department's Bulletin No. 120-68.

Table 3 presents information on precipitation at selected stations in the service areas. The seasonal precipitation gives an indication of the related water supply available for distribution and provides a basis for comparing the current year's supply with long time average supply.

Streamflow

The general water supply available for diversion within each watermaster area is determined from stream gaging stations placed at key locations in the main stream channels. Several major stations are installed and maintained by the United States Geological Survey or by the Department of Water Resources as part of a Federal-State program for collection of year-round streamflow records. In addition, several stream gaging stations are installed and operated by the watermaster during the irrigation season to provide supplemental information. Also, water stage recorders are often installed by the watermaster in selected diversion ditches to further assist him in proper distribution of the various water right allotments.

Table 4 presents runoff data at selected stream gaging stations in or near the service areas. Runoff data at stream gaging stations used by the watermasters are contained in tables following the description of each area. These data are used in

TABLE 2

SNOWPACK AS OF APRIL 1 AND MAY 1, 1968 AT REPRESENTATIVE SNOW COURSES

Watermaster Service Area	Snow Course *	Elevation (In feet)	Water Content of Snow (in inches) April 1 Average	April 1 1968	In Percent of April 1 Average	May 1 1968	In Percent of April 1 Average **
Shackleford Creek	Parks Creek	6,700	34.0	32.5	96		
Shasta River	Middle Boulder No. 1	6,600	30.5	18.7	61	9.1	30
	Little Shasta	6,200	20.0	12.5	63		
Ash Creek	Blue Lake Ranch	7,300	9.9	5.5	56		
Big Valley	Eagle Peak	7,200	15.6	8.1	52		
North Fork Pit River	Cedar Pass	7,100	16.7	12.2	73	6.0	36
South Fork Pit River	Adin Mountain	6,350	13.2	12.3	93	0.0	0
Surprise Valley							
Burney Creek	Thousand Lakes	6,500	35.7	31.0	87	21.0	59
Cow Creek	New Manzanita Lake	5,900	7.3	1.8	25	0.0	0
Digger Creek	Burney Springs	4,700	2.4	0.0	0		
Hat Creek							
Butte Creek	Humbug Summit	4,850	11.6	5.8	50		
Susan River	Silver Lake Meadows	6,450	27.6	26.7	97	10.4	38
	Fredonyer Pass No. 1	5,750	8.8	0.0	0		
Indian Creek	Independence Lake	8,450	40.3	35.8	89		
Middle Fork	Mount Deyer No. 1	7,100	24.3	20.8	86	10.2	42
Feather River	Rowland Creek	6,700	17.4	14.0	80	3.0	17
	Yuba Pass	6,700	30.4	23.3	77	5.3	17

* Snow courses are listed according to elevation within each major grouping of watermaster service areas. They do not necessarily correspond to a specific service area.

** Data collected for selected courses.

TABLE 3

PRECIPITATION AT SELECTED STATIONS - 1967-68 SEASON

Station Name	County	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total	Percent of Mean
Fort Jones Ranger Station	Siskiyou	1.62 1.59	1.51 2.77	5.43 4.02	4.23 4.06	3.16 3.14	1.28 2.21	0.07 0.98	0.24 1.11	0.53 0.81	0.00 0.35	0.67 0.34	0.13 0.40	18.87 21.78	87
Happy Camp Ranger Station	Siskiyou	3.40 4.07	3.88 7.25	8.02 10.41	12.50 11.31	7.62 8.24	5.19 6.45	0.55 2.72	1.74 2.16	0.12 1.06	0.00 0.38	2.66 0.17	0.34 0.74	46.02 54.96	84
Yreka	Siskiyou	1.47 1.45	1.17 2.00	3.83 3.30	2.70 3.19	2.17 2.29	0.98 1.61	0.12 0.92	0.27 1.03	0.53 0.86	0.02 0.27	1.73 0.39	0.14 0.45	15.13 17.76	85
Chico Experiment Station	Butte	0.38 1.46	2.93 2.41	1.97 5.12	7.32 5.03	4.37 4.43	3.52 3.29	0.23 2.31	0.71 1.16	0.22 0.44	T 0.01	0.50 0.07	0.03 0.33	22.18 26.06	85
Redding Fire Station No. 2	Shasta	1.16 2.27	3.88 3.76	4.57 7.26	8.89 7.69	8.64 6.19	4.70 4.90	0.95 2.95	0.17 1.74	0.66 1.31	0.00 0.11	1.78 0.13	0.05 0.61	35.45 38.92	91
Hat Creek Power House No. 1	Shasta	1.08 1.30	1.71 1.83	3.63 2.93	5.24 2.85	2.29 2.84	1.91 2.02	0.19 1.35	0.80 1.26	0.49 0.77	0.00 0.28	1.22 0.16	0.13 0.47	18.69 18.06	103
Lakeview, Oregon	Lake	0.73 1.21	1.32 1.37	1.41 1.88	1.86 1.84	2.53 1.71	0.71 1.52	0.19 1.15	2.11 1.51	1.46 1.28	0.00 0.22	2.65 0.17	0.06 0.58	15.03 14.44	104
Alturas Ranger Station	Modoc	0.26 1.07	0.88 1.35	1.53 1.63	1.88 1.62	1.39 1.45	0.61 1.37	0.20 1.03	1.46 1.31	0.47 1.03	0.00 0.31	1.97 0.22	0.00 0.43	10.65 12.82	83
Jess Valley	Modoc	0.50 1.31	1.92 1.66	1.07 1.92	1.49 1.89	2.52 1.95	1.30 1.88	0.76 1.64	2.15 2.02	0.61 1.62	0.80 0.41	3.45 0.26	T 0.66	16.57 17.22	96
Cedarville	Modoc	0.99 1.17	1.67 1.41	0.63 1.69	1.26 1.84	1.95 1.50	0.82 1.45	0.40 0.99	1.02 1.04	0.60 0.94	T 0.33	1.77 0.15	0.06 0.37	11.17 12.88	87
Susanville Airport	Lassen	1.34 0.92	1.46 1.51	1.36 2.56	4.98 2.53	1.15 2.51	0.82 1.51	0.12 0.82	0.07 0.83	0.27 0.67	0.74 0.18	0.63 0.09	0.00 0.35	12.94 14.48	89
Greenville Ranger Station	Plumas	1.42 2.61	3.20 4.81	5.54 5.93	13.15 8.89	4.11 7.44	4.24 6.47	0.29 2.84	1.06 1.71	0.55 0.75	0.00 0.35	1.00 0.21	0.08 0.95	34.64 42.96	81
Sierraville Ranger Station	Sierra	1.52 1.83	1.77 2.76	3.54 4.49	4.25 4.94	3.53 4.23	2.31 2.84	0.12 1.63	0.11 1.25	0.59 0.54	0.01 0.29	0.77 0.15	0.00 0.44	18.52 25.39	73
Vinton	Plumas	1.12 0.89	0.84 1.44	1.20 2.12	1.89 1.94	1.26 1.87	1.20 1.43	0.25 0.84	0.24 1.01	0.35 0.50	0.04 0.36	1.15 0.18	0.01 0.25	9.55 12.83	74

conjunction with schedules showing total water rights to determine the adequacy or shortage of the water supply.

Essentially all watermaster service areas experienced near drought conditions during the 1968 irrigation season, with the driest year of record occurring in several areas. However, a timely heavy rain occurred in late August which helped to lessen the severity of the extreme dry-year flows.

TABLE 4

RUNOFF AT SELECTED STATIONS

1967-68 SEASON
(In acre-feet)

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total	Average	Percent Average
Shasta River near Yreka	11,100	11,390	13,600	16,160	18,250	12,930	3,820	3,950	2,960	743	2,320	3,420	100,600	127,400	79
Hat Creek near Hat Creek	8,360	8,090	7,960	8,370	8,560	8,980	8,670	10,370	9,200	7,830	7,600	7,110	101,100	94,840	107
Pit River near Canby	4,160	4,390	4,340	8,280	42,870	9,680	5,190	8,520	4,520	1,810	4,580	2,080	100,420	164,300	61
South Fork Pit River near Likely	1,790	1,600	1,560	1,740	3,860	1,050	5,370	6,050	6,180	5,960	6,080	3,300	44,540	51,910	86
Susan River at Susanville	697	776	784	1,720	9,290	7,330	6,940	6,720	5,950	4,000	252	183	44,640	69,070	65
Indian Creek near Crescent Mills	5,290	6,270	10,180	17,370	81,230	62,620	45,100	20,730	5,860	1,300	1,210	1,340	258,500	385,900	67
Middle Fork Feather River near Cilo	4,890	4,910	6,090	7,900	55,430	28,230	13,610	7,540	3,970	1,280	1,210	1,160	136,200	196,900	69
Butte Creek near Chico	8,860	8,490	13,150	25,930	51,500	39,520	26,970	20,640	12,510	8,350	8,160	7,520	231,600	282,300	82

PART II - 1968 WATERMASTER SERVICE

This part of the report gives a general geographical description of each watermaster service area and the major sources of water supply therein. The usual methods of distribution and the actual distribution of the water supply of the 1968 season are discussed. Special occurrences in some areas are also mentioned.

Ash Creek Watermaster Service Area

The Ash Creek service area is located in Modoc and Lassen Counties near the town of Adin. There are 32 water right owners in this area with total allotments of 123.65 cubic feet per second.

The major sources of water supply for the service area are Ash Creek and three tributaries, Willow Creek, Rush Creek, and Butte Creek. Ash Creek rises in the eastern part of the service area and flows westerly through the town of Adin into Ash Creek Swamp and then into the Pit River. Rush Creek heads in the northeastern part of the service area and joins Ash Creek above the town of Adin. Willow Creek and Butte Creek originate in the southeastern part of the service area and join Ash Creek near the head of Ash Creek Swamp. Each of these streams is independently regulated.

Approximately 85 percent of the water rights in the service area are in Big Valley, west of the town of Adin. The remaining water rights are along the upstream tributaries and in Ash Valley. The portion of Big Valley served is approximately 10 miles long by 6 miles wide, extending from the town of Adin to the confluence of Ash Creek and the Pit River. The valley floor is at an elevation of approximately 4,200 feet.

A schematic drawing of each major stream system within the Ash Creek service area is presented as Figure 2, page 9.

Water Supply

The water supply for Ash and Rush Creeks is derived primarily from snowmelt, since most of the watershed is between 5,000 and 6,000 feet in elevation. Willow Creek and Butte Creek receive a substantial portion of their water from springs. These creeks normally have sufficient water to satisfy demands until about June 1, after which the supply decreases rapidly. By the latter part of June, Ash Creek normally has receded to about 20 cubic feet per second, Rush Creek to about two cubic feet per second, Willow Creek to about five cubic feet per second, and Butte Creek to less than one cubic foot per second. The flow of these creeks then remains nearly constant for the remainder of the season.

The daily mean discharge of Ash Creek at Adin is presented in Table 5, page 8. This stream gaging station is located below a substantial number of the points of diversion; consequently, the table does not include all of the available supply of this creek.

No stream gaging stations were installed on Butte, Rush or Willow Creeks during the 1968 season.

Method of Distribution

Irrigation diversions from Ash Creek and its tributaries are accomplished by small dams placed in the stream channels. Most of the users have several diversion ditches at these dams. These ditches convey the water to the fields where it is spread by means of small laterals. Some of the users employ a system of checks and borders, but most of the land is

irrigated by wild flooding. Return flow is captured by downstream ranches for reuse. In one case a rancher may recirculate his drain water before returning it to the creek for further use. In a few areas, pumps are used to divert the water into ditches or through sprinkler systems.

The Ash Creek decree (see Table 1) establishes the number of priority classes on the various stream systems within the Ash Creek service area as follows: Ash Creek - five; Willow Creek - four; Rush Creek - one; and Butte Creek - two.

ASH CREEK WMSA

TABLE 5
DAILY MEAN DISCHARGE
ASH CREEK AT ADIN
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	139	57	27	14	14	18	24
2	122	57	25	20	9.7	19	24
3	111	51	25	21	9.1	20	21
4	103	51	22	20	19	20	18
5	107	59	20	35	15	21	21
6	98	56	18	45	16	21	22
7	89	50	22	36	16	22	22
8	82	47	16	29	16	21	20
9	72	48	14	26	17	21	14
10	66	50	14	27	14	21	14
11	62	55	20	16	9.1	21	14
12	58	54	36	20	13	17	16
13	64	47	56	27	15	19	16
14	69	45	48	21	18	21	19
15	62	45	41	19	16	21	23
16	66	45	34	19	19	24	21
17	82	41	29	19	18	24	17
18	77	45	25	13	16	24	20
19	68	40	27	16	16	37	20
20	61	36	29	21	16	35	21
21	56	36	19	16	16	32	22
22	54	33	34	16	16	27	23
23	49	32	42	14	16	25	22
24	48	31	40	14	16	24	22
25	62	31	44	9.7	17	22	22
26	54	29	36	9.1	17	23	22
27	53	29	30	16	17	24	21
28	50	29	26	13	17	24	22
29	50	27	25	13	17	23	21
30	53	25	24	13	17	23	20
31	55		18		18	24	
Mean	72.3	42.7	28.6	19.9	15.7	23.2	20.1
Runoff in acre-feet	4450	2540	1760	1190	964	1420	1200

1968 Distribution

Watermaster service began May 1 in the Ash Creek service area and continued until September 30. George H. Pape, Associate Engineer, Water Resources, was watermaster during this period.

Ash Creek. The available water supply in Ash Creek was sufficient to supply a portion of third priority allotments during April and part of May. For most of the remainder of the season, water was available for first priority allotments only.

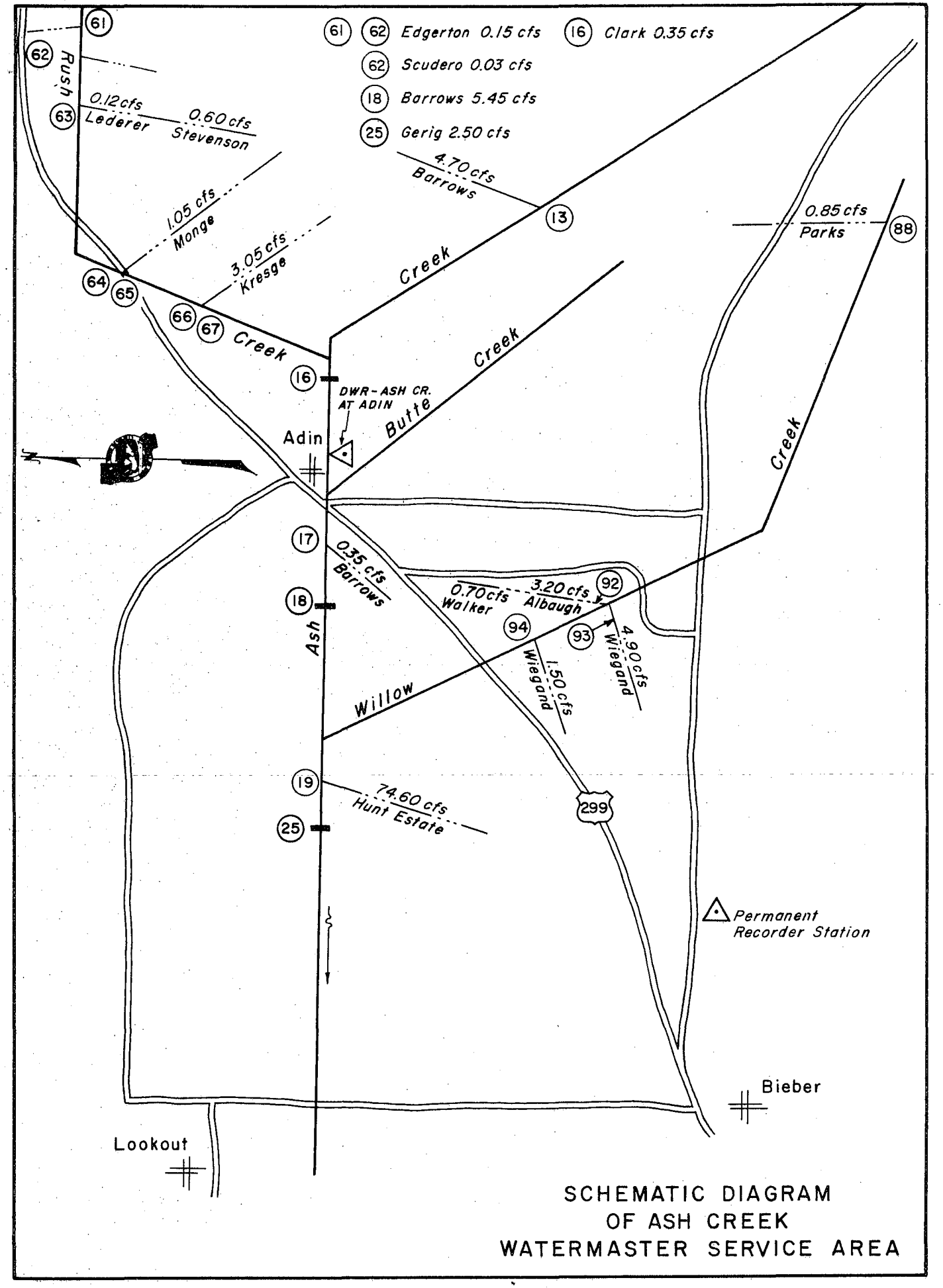
Willow Creek. The available water supply in Willow Creek was sufficient to supply fourth priority allotments for the first few days in May. All first and a portion of second priority allotments were regulated for the rest of the season. Twenty-five percent of second priority allotments was available at the end of the season.

Rush Creek. Sufficient water to satisfy all rights (one priority) was available for a short time in May. The flow decreased steadily to a seasonal low of 20 percent of the allotments.

A new diversion dam was built and a section of ditch was realigned at diversion number 63, which supplies the Lederer and Stevenson properties.

Butte Creek. The available water supply in Butte Creek was sufficient to satisfy all allotments (two priorities) until late spring. During the remainder of the season the flow gradually decreased; however, no distribution problems were encountered.

FIGURE 2



SCHEMATIC DIAGRAM
OF ASH CREEK
WATERMASTER SERVICE AREA

Big Valley Watermaster Service Area

The Big Valley service area is located in Modoc and Lassen Counties in the vicinity of the towns of Lookout and Bieber. There are 53 water right owners in the area with total allotments of 231.03 cubic feet per second.

The Pit River is the major source of water supply for the service area. The river enters the valley north of the town of Lookout and flows southerly through the western part of the valley and out its southern end. The major place of use is about 13 miles of valley floor along the Pit River at an approximate elevation of 4,200 feet.

A schematic drawing of the Big Valley stream system is presented as Figure 3, page 14.

Water Supply

The available water supply in the Pit River as it flows through Big Valley is ordinarily adequate to satisfy all demands until about June 1. The irrigation practices in Hot Springs Valley, located about 20 miles upstream from Big Valley, have a significant effect on the available water supply in Big Valley throughout the remainder of the irrigation season. Water users in Hot Springs Valley divert most of the flow in Pit River for two or three week periods. Natural flow available for use in Big Valley during these periods is often less than 20 cubic feet per second. Periodic releases from channel storage reservoirs in the lower end of the valley sometimes increase the flow to as much as 200 to 300 cubic feet per second for relatively short periods. Consequently, equitable water distribution in Big Valley is very difficult to attain.

Roberts Reservoir, located on a minor tributary of the Pit River at the upper end of Big Valley above Lookout, serves as a supplemental source of water to those users in the area who are members of the Big Valley Mutual Water Company. Water from this reservoir is released into the Pit River and distributed to members of the water company along with the natural flow to which they are entitled.

Records of two stream gaging stations in the Big Valley service area are presented in Tables 6 and 7, page 12.

Method of Distribution

Most water users in the Big Valley service area irrigate on a rotation schedule by either wild flooding or by checks and borders. Large flashboard dams placed in the channel make it possible to use the large heads of water characteristic of the supply in the area. In addition, some pumps are used for diversion, both in ditches and directly into sprinkler systems. The ranches which irrigate by wild flooding must use large heads of water in order to cover unleveled or high ground. Much of the runoff is recaptured for use by downstream lands, resulting in a relatively high irrigation efficiency for the valley.

The Big Valley decree (see Table 1) provides for the distribution of water from Pit River in four priority classes.

1968 Distribution

Watermaster service began April 26 in the Big Valley service area and continued until September 30. Virgil D. Buechler, Water Resources Technician II, was watermaster during this period.

Watermaster service began early because the snowpack in the Warner Mountains, drainage to the Pit River and Big Valley, was extremely light at the beginning of the irrigation

TABLE 6
DAILY MEAN DISCHARGE
PIT RIVER NEAR CANBY
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	382	98	78	86	50	12	45
2	323	100	52	66	62	10	40
3	285	103	44	55	53	15	38
4	244	114	65	46	60	26	35
5	225	117	91	64	92	30	26
6	219	113	111	116	60	31	34
7	208	112	104	161	46	92	31
8	192	117	113	199	51	91	29
9	176	111	100	238	41	72	27
10	159	94	96	241	35	45	25
11	148	88	57	193	32	33	24
12	147	95	79	98	30	27	22
13	155	95	110	57	16	33	18
14	128	71	143	52	24	39	14
15	119	57	187	53	26	48	13
16	115	58	256	48	27	65	13
17	123	53	206	29	27	66	13
18	128	49	164	16	14	111	12
19	130	15	120	53	11	104	12
20	116	46	101	69	8.9	149	13
21	103	20	101	50	9.6	148	24
22	106	29	96	39	11	127	27
23	116	30	82	41	8.4	131	13
24	109	56	125	20	15	147	107
25	106	57	355	22	37	143	102
26	105	60	398	23	17	130	115
27	110	102	327	28	10	109	72
28	107	200	223	19	11	89	40
29	101	221	158	34	11	75	34
30	99	138	62	62	7.8	61	29
31	97		91		9.3	52	
Mean	157	87.3	139	75.9	29.5	74.5	34.9
Runoff in acre-feet	9680	5190	8520	4520	1810	4580	2080

TABLE 7
DAILY MEAN DISCHARGE
PIT RIVER NEAR BIEBER
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	1400	306	9.2	103	4.8	1.0	6.4
2	1130	312	7.2	84	3.8	0.9	10
3	935	323	22	69	2.9	0.7	42
4	823	320	42	58	2.2	0.6	49
5	730	323	34	62	1.5	0.4	17
6	694	323	15	110	1.0	0.4	8.8
7	658	316	7.6	136	2.0	0.3	6.4
8	605	302	4.5	89	9.6	0.2	22
9	550	288	5.0	72	7.2	0.3	19
10	500	278	4.2	79	8.4	0.2	17
11	458	257	7.1	95	18	0.2	28
12	426	218	60	61	14	0.3	19
13	426	215	30	32	7.6	0.4	10
14	458	228	76	54	4.8	0.6	6.0
15	478	218	176	33	3.8	0.8	5.8
16	478	163	193	21	3.1	0.9	5.5
17	535	79	338	219	2.7	1.3	5.5
18	605	76	218	122	2.2	1.3	8.0
19	560	74	188	58	1.8	2.5	5.9
20	500	77	182	35	1.6	3.8	4.8
21	458	45	161	22	2.2	2.9	6.0
22	418	26	142	18	1.7	2.5	5.5
23	382	50	130	16	1.3	1.8	35
24	362	82	158	16	1.0	1.8	55
25	362	95	154	15	0.9	2.7	27
26	382	29	73	14	0.9	26	18
27	374	20	17	9.2	1.0	21	9.2
28	362	16	84	6.0	0.8	24	22
29	350	14	338	5.0	0.7	31	43
30	334	14	334	5.0	0.8	14	14
31	320		179		0.9	10	
Mean	550	170	109	57.3	3.7	5.0	17.7
Runoff in acre-feet	33820	10090	6720	3410	229	307	1050

season. Since the flows of the Pit River were low, it was determined that channel storage and an irrigation should be started immediately. The Lookout flashboard dam was installed April 26, and the downstream dams were installed daily thereafter. The first irrigation was started April 26 and completed May 7. The water supply for the irrigation season looked very bad until May 20, when a storm hit the Big Valley-Alturas area, providing some snowpack and raising the peak flow in the Pit River to 350 cubic feet per second.

Three irrigation rotation programs were completed prior to haying. Towards the end of the haying season all pumpers were allowed to irrigate so they could be completed prior to the start of a flood irrigation rotation. The lower users received an irrigation during haying and were told to preserve their channel storage for stock water.

By August 1, the flow in the Pit River had dropped to 20 cubic feet per second. At this time, it was determined that the first rotation would be on the basis of 5 acre-feet per second foot of water right. This quantity of water would only provide stockwater and fill the sloughs. The Big Valley mutual water users were allowed to use their shares of Roberts Reservoir water to provide an irrigation.

The next irrigation rotation looked extremely bleak until August 19, when a very rare storm deposited 3 inches of rain and raised the flow in the Pit River to an average of 120 cubic feet per second for 12 days. This allowed all water users in Big Valley to receive a complete irrigation. This storm, followed by warm weather, resulted in a very good second growth of alfalfa and winter pasture.

The third and final irrigation rotation, based on 10 acre-feet per second-foot of water right, was completed in the period September 1 to 16.

Water was released from Roberts Reservoir for use by Big Valley mutual water users association shareholders as follows:

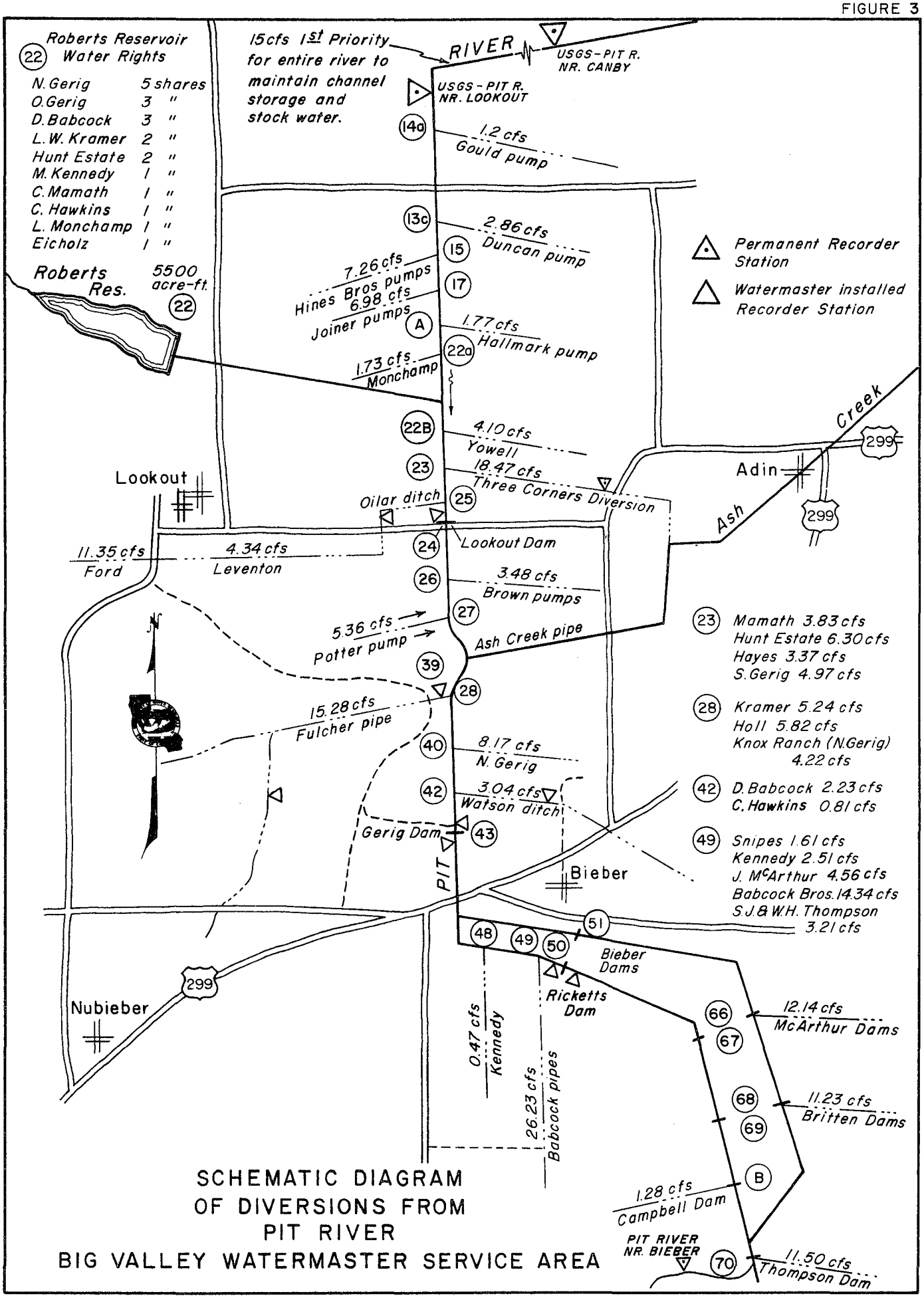
July 27 - August 18

Name	Acre-feet
Eicholz Ranch	100
Cyril Mamath	75
Hunt Estate	75
Oral (Sam) Gerig	92
L. W. Kramer	100
Norris Gerig	114
Merlin Kennedy	36
D. Babcock	100
C. Hawkins	100
Subtotal	792

September 16 - October 1

D. Babcock	50
C. Hawkins	50
Total	892

FIGURE 3



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
PIT RIVER
BIG VALLEY WATERMASTER SERVICE AREA

Burney Creek Watermaster Service Area

The Burney Creek service area is located in Shasta County near the town of Burney. There are 11 water right owners in the area with total allotments of 33.09 cubic feet per second. The source of water supply for this service area is Burney Creek, which enters the southern part of the service area and flows through Burney in a northerly direction to the Pit River. The portion of the valley served by this stream is approximately 11 miles long and two miles wide, and extends both north and south of Burney. The service area is at approximately 3,200 feet elevation.

A schematic drawing of the Burney Creek stream system is presented as Figure 4, page 17.

Water Supply

The water supply for Burney Creek comes from springs and snowmelt. Most of the watershed lies between the elevations of 4,000 and 7,500 feet on the northeast slopes of Burney Mountain. The creek normally has sufficient water to supply all demands until about the middle of June. The supply then gradually decreases until the end of July. For the remainder of the irrigation season runoff from perennial springs keeps the flow nearly constant at approximately 40 percent of allotments.

The daily mean discharge of Burney Creek near Burney is presented in Table 8. The stream gaging station on Burney Creek is located below four points of diversion; consequently, the records do not show all of the available water supply of the creek.

Method of Distribution

The Burney Creek decree (see Table 1) sets forth a rotation schedule of distribution. The water users, however, have found it more beneficial to irrigate on a continuous-flow basis (one priority class plus surplus allotments), which is now normal practice. The water allotted to the Greer-Cornaz Ditch is distributed in accordance with supplemental court decrees.

BURNEY CREEK WMSA

TABLE 8
DAILY MEAN DISCHARGE
BURNEY CREEK NEAR BURNEY
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	234	166	71	27	12	9.6	12
2	204	156	68	27	12	9.2	12
3	188	141	66	26	11	11	12
4	181	131	64	28	10	10	9.6
5	224	134	64	45	9.2	9.6	9.6
6	196	129	63	53	8.2	11	10
7	168	121	60	43	13	11	11
8	152	116	56	38	16	11	12
9	136	118	56	33	18	10	12
10	121	121	50	30	16	11	13
11	120	138	58	30	16	9.6	13
12	134	139	60	27	15	9.6	13
13	128	120	113	22	16	9.2	14
14	132	110	96	20	15	11	20
15	139	108	63	20	15	11	18
16	196	102	60	20	15	11	17
17	163	91	54	16	13	12	16
18	128	88	52	18	13	11	16
19	107	86	54	19	12	24	16
20	104	83	76	18	13	24	15
21	99	83	63	16	11	32	15
22	99	82	71	15	9.6	25	15
23	104	79	78	19	10	18	15
24	104	76	66	20	9.6	15	15
25	169	75	58	12	9.2	14	14
26	168	75	57	12	9.2	16	12
27	132	75	53	13	8.7	16	13
28	126	75	43	16	9.2	16	10
29	132	70	38	13	8.7	15	9.6
30	148	68	36	13	8.2	15	11
31	156		33		8.7	13	
Mean	148	105	61.3	23.6	12.0	13.9	13.4
Runoff in acre-feet	9110	6260	3770	1410	735	854	795

1968 Distribution

Watermaster service began May 1 in the Burney Creek service area and continued until September 30. Virgil D. Buechler, Water Resources Technician II, was

watermaster during the early part of the irrigation season. From July through September, Ross P. Rogers, Water Resources Engineering Associate, assumed those duties.

All allotments were distributed on a continuous flow basis. This practice, rather than that of rotation as called for in the decree, has been used for many years by agreement of the water right owners.

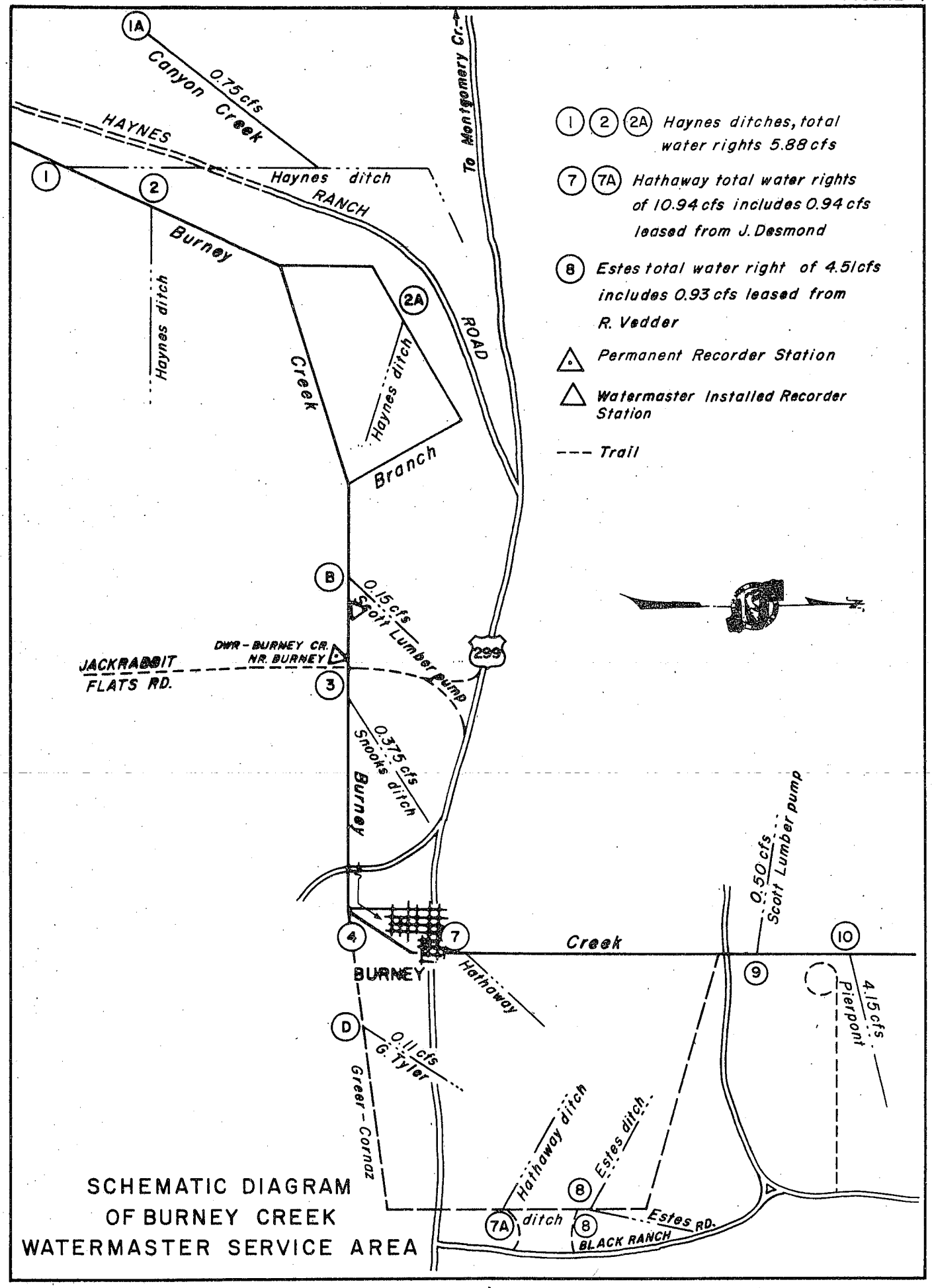
The Pierpont Ranch, lowest decreed user on Burney Creek, did not irrigate during the 1968 season. Therefore, except for stockwater allotments delivered to the ranch, its irrigation water rights were apportioned among the other users on the creek.

The available water supply for the 1968 irrigation season was well below average due to a severe shortage of precipitation during the late winter and early spring months. Surplus flow was available to all users until early June. All diversions were then regulated to 100 percent of first priority allotments. The supply gradually decreased to the seasonal low of about 40 to 50 percent of first priority allotments during mid-August.

A substantial rainstorm lasting several days began on August 18. This provided welcome relief from the existing drought conditions. The rainfall was of significant value in alleviating an extremely serious water shortage.

By early September the supply in Burney Creek had once again diminished to about 50 percent of first priority allotments. However, the effect was less severe than that in July and August. The recent rainfall, combined with the normally cooler temperatures of September, enabled most ranchers to get through the irrigation season without drastically reduced pasture growth.

FIGURE 4



SCHEMATIC DIAGRAM
OF BURNEY CREEK
WATERMASTER SERVICE AREA

Butte Creek Watermaster Service Area

The Butte Creek service area is located in Butte County southeast of the City of Chico. There are 34 water right owners in the area with total allotments of 329.71 cubic feet per second. Butte Creek is the major source of water supply. The watermaster service area extends for about 11 miles along Butte Creek, commencing approximately four miles east of Chico and extending downstream to the crossing of Western Canal. It contains about 20,000 acres of valley floor lands at an average elevation of 150 feet.

A schematic drawing of the Butte Creek stream system is presented as Figure 5, page 23.

Water Supply

Butte Creek, above the watermaster service area, drains approximately 150 square miles of the western slope of the Sierra Nevada Mountains in the northeasterly portion of Butte County. The maximum elevation in the watershed is about 7,000 feet.

Snowmelt normally produces sustained high flows in the creek until about the end of June, after which perennial springs continue to produce flows of more than 40 cubic feet per second. Additional water is imported for distribution from the West Branch Feather River by means of the Hendricks (Toad Town) Canal through De Sabla Reservoir and Powerhouse into Butte Creek.

Records of the daily mean discharge at stream gaging stations in the Butte Creek service area are presented in Tables 9, 10, and 11, page 20.

Method of Distribution

Water is diverted from Butte Creek by pumping and by gravity diversions. Parrott Investment Company, M & T Incorporated, Dayton Mutual Water Company, and Durham Mutual Water Company divert relatively large amounts of water by gravity into ditches leading to their individual distribution systems. Various methods of irrigation are in general practice. These include contour checks, strip or border checks, basin checks, furrows, wild flooding, and sprinklers. The use of sprinklers has increased in popularity within the past few years, especially for use on orchards.

Water diverted to Butte Creek from the West Branch Feather River through the Hendricks Canal and De Sabla Powerhouse at times causes wide fluctuation in the Butte Creek flow. In accordance with "Memorandum and Order" entered May 10, 1949, by the Superior Court of Butte County, water users below Parrott Dam (where the imported water is rediverted) must be provided their natural flow allotments at all times without undue fluctuation caused by intermittent presence of imported water. For the past several years PG&E has maintained reasonably steady releases. However, because of damage to some of their facilities, fluctuations in 1968 were greater than usual.

The Butte Creek decree (see Table 1) established three priority classes for summer distribution purposes and, in addition, defined two surplus flow allotments.

1968 Distribution

Watermaster service began May 28 in the Butte Creek service area, and continued until September 30. Mr. C. L. Linser, Associate Engineer, Water Resources, was watermaster during this period.

The available water supply for the 1968 irrigation season was below

TABLE 9
DAILY MEAN DISCHARGE

BUTTE CREEK NEAR CHICO

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	694	597	392	267	149	140	120
2	643	579	385	263	149	131	124
3	604	544	382	261	150	126	127
4	575	526	385	258	146	123	129
5	568	519	383	255	143	122	124
6	543	502	367	273	143	121	126
7	535	489	354	265	128	120	130
8	548	473	346	253	141	116	123
9	512	468	341	241	142	117	124
10	477	476	338	236	134	120	125
11	452	494	335	239	122	114	124
12	506	497	332	235	122	118	124
13	881	483	358	224	129	119	124
14	940	467	354	211	122	123	131
15	764	462	329	209	123	128	129
16	1170	462	314	203	126	128	126
17	1090	453	306	197	133	131	122
18	820	427	304	195	125	127	120
19	696	414	309	186	154	143	122
20	623	414	339	187	145	210	124
21	599	406	333	180	146	198	125
22	582	395	350	176	146	164	125
23	561	383	351	175	146	149	124
24	555	376	352	172	146	136	123
25	581	376	327	168	141	132	122
26	586	377	310	163	128	130	122
27	559	381	300	158	132	128	134
28	536	382	292	152	120	128	139
29	562	387	284	152	122	129	138
30	577	388	279	154	128	124	141
31	587		273		128	121	
Mean	643	453	336	210	136	133	126
Runoff in acre-feet	39520	26970	20640	12510	8350	8160	7520

TABLE 10
DAILY MEAN DISCHARGE

BUTTE CREEK NEAR DURHAM

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	736	605	174	63	11	6.9	6.2
2	685	591	170	58	14	7.3	6.2
3	629	556	163	50	16	7.8	6.5
4	591	528	160	52	17	9.4	6.9
5	584	521	152	50	14	8.2	6.9
6	570	500	138	60	12	7.3	6.9
7	556	486	129	58	16	6.9	7.3
8	570	452	121	55	8.2	7.3	7.8
9	535	378	115	53	8.2	7.8	8.6
10	493	384	105	49	7.8	9.9	12
11	458	389	105	49	7.8	14	9.9
12	486	413	107	43	5.9	7.3	7.8
13	970	394	146	40	5.6	6.9	8.6
14	1030	372	166	37	6.2	10	11
15	851	367	142	32	6.9	10	15
16	1260	362	132	33	7.8	11	12
17	1210	345	129	27	9.4	14	9.4
18	900	330	127	28	7.8	16	9.0
19	744	300	132	22	8.2	16	9.4
20	661	264	166	16	5.9	63	14
21	613	236	174	16	5.3	63	18
22	598	198	180	20	5.0	36	18
23	570	194	174	16	5.0	23	18
24	563	180	174	18	5.0	16	16
25	584	170	142	19	5.9	12	18
26	598	177	127	20	5.0	10	18
27	563	180	110	15	6.5	9.0	21
28	542	180	101	17	5.0	8.6	25
29	563	170	88	10	4.7	12	30
30	570	170	74	11	5.0	14	53
31	598		64		5.6	7.8	
Mean	674	346	135	34.6	8.2	14.8	13.9
Runoff in acre-feet	41420	20610	8300	2060	503	909	826

33208

TABLE 11
DAILY MEAN DISCHARGE

TOADTOWN CANAL ABOVE BUTTE CANAL

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	114	122	111	113	58	62	52
2	113	120	110	113	58	58	56
3	113	121	111	113	59	56	60
4	117	119	114	111	56	55	61
5	120	118	114	110	55	56	56
6	119	117	114	113	58	57	61
7	119	116	114	112	58	58	62
8	119	114	114	110	57	55	56
9	119	116	115	106	59	58	57
10	117	114	114	110	49	56	56
11	117	115	114	114	43	54	56
12	118	115	114	107	44	56	56
13	119	114	115	99	43	56	56
14	125	114	117	90	44	58	58
15	123	119	116	91	41	62	57
16	125	116	115	89	42	63	56
17	119	115	114	86	56	59	55
18	122	115	115	83	61	58	55
19	122	115	115	80	76	78	55
20	124	114	115	78	73	86	57
21	125	114	115	72	75	81	58
22	125	113	116	71	76	69	58
23	125	111	115	73	76	66	58
24	125	110	114	71	74	59	58
25	124	111	113	67	64	58	57
26	124	108	113	65	62	58	56
27	124	110	113	60	57	56	69
28	123	110	113	59	57	59	70
29	123	110	113	59	57	60	69
30	122	112	113	60	56	54	71
31	121		113		59	53	
Mean	121	115	114	89.5	58.2	60.5	58.7
Runoff in acre-feet	7430	6820	7010	5330	3580	3720	3490

normal. However, several first priority water right owners did not use water, so those who did divert did not have severe shortages.

Flow to the surplus class diversions of Newhall Land and Farming Company and Gorrill Land Company continued until about June 20. The amount of water available continued to decrease slowly. By July 20 each first priority diverter was receiving about 90 percent of his entitlement. First priority allotments were reduced to about 80 percent on August 1.

Owners of almond orchards completed their irrigating season about August 1. Although the available water continued to decrease, less water was needed by users so no real shortage existed.

Special Occurrences

Several applications to appropriate

surplus water during the spring months are presently under consideration by the State Water Resources Control Board, Division of Water Rights. If these applications are approved, the length of watermaster service to the area will probably be extended. Work would probably begin in late April or early May instead of late May.

Several measuring devices are planned for construction as soon as water right permits are granted by the Board. Needed most are; a Parshall flume in the Gorrill Land Company's diversion ditch, a Parshall flume or similar structure in the Newhall Land and Farming Company's diversion system, a rectangular weir and concrete structure in Hamlin Slough, and repair of an existing Parshall flume in the Camenzind Brothers diversion ditch.

Diversion #	Water Right Owner	Amount in cfs	Remarks
Butte Creek			
50	M. & T. Incorporated	53.33	Imported water*
	M. & T. Incorporated	25.00	Surplus class
	Parrott Investment Company	53.33	Imported water*
	Parrott Investment Company	25.00	Surplus class
X	Taylor	3.00	
XX	Dayton Mutual Water Company	16.00	
	Dayton Mutual Water Company	3.33	Imported water*

*Water imported by PG&E from West Branch Feather River via Hendricks Canal and released into Butte Creek, less 5% for conveyance losses.

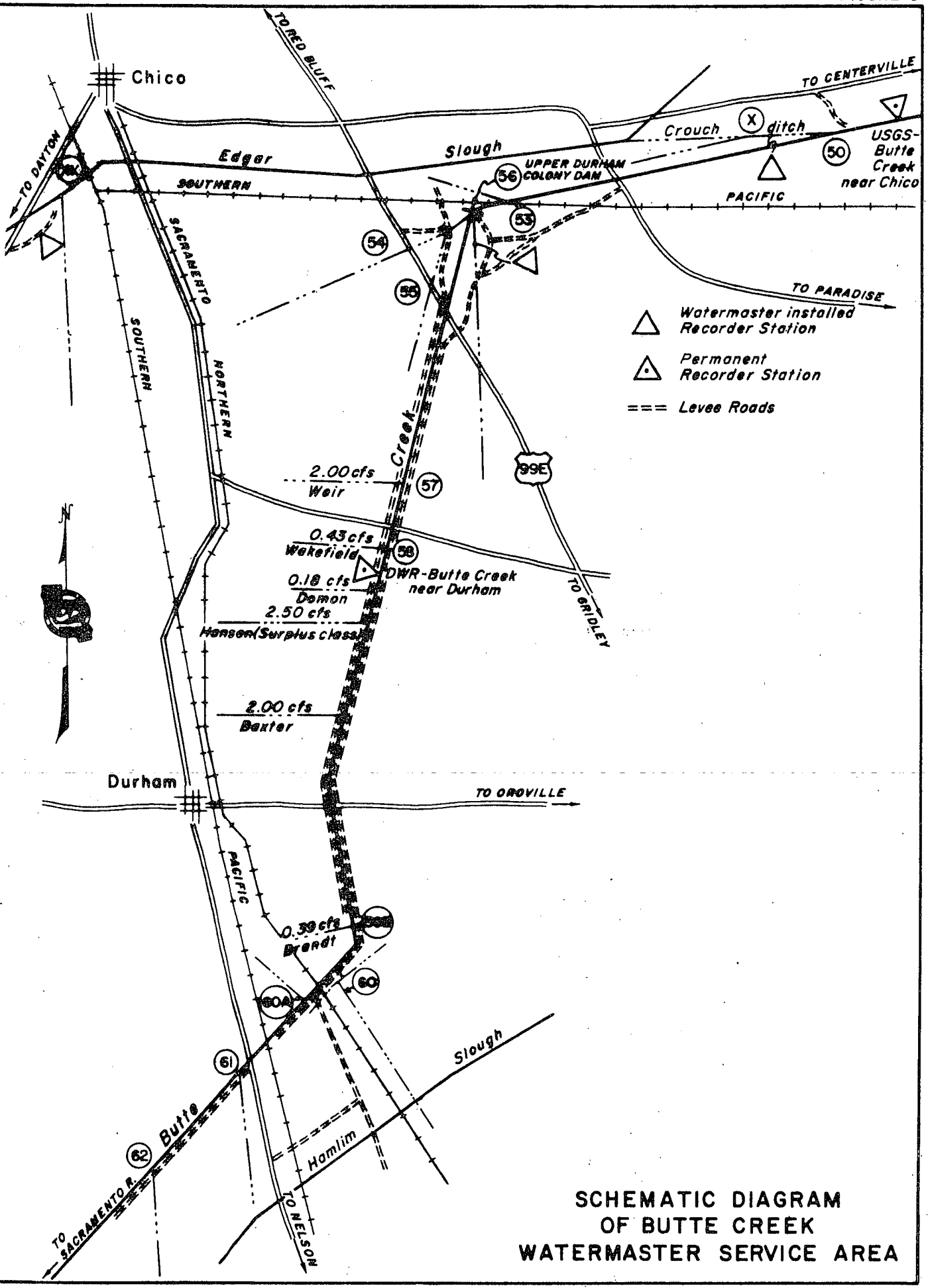
53	U. S. Department of Agriculture	2.00
54	Patrick	3.33
	Lavy	1.89
	Smith	0.555
	Towne and Jayred	1.115
55	Camenzind Brothers	3.11
56	Durham Mutual Water Company	44.70
	Parrott Investment Company	2.00
	Carlson	0.48
	Bell	0.39
	Domon Brothers	0.67
	Logan	0.01
	Vernoga	1.447
	Konyn	0.40
	Bebich	0.446
	Setka	0.447
	Wheelock	0.26
	Total	51.25
60	Newhall Land & Farming Company	6.75
	Newhall Land & Farming Company	21.25 — Surplus class
60A	Phillips	0.66
61	Gorrill Land Company	1.00
	(See Hamlin Slough)	20.70 — Surplus class
62	White	1.00
		9.50 — Surplus class

Hamlin Slough

Newhall Land & Farming Company	16.60
Gorrill Land Company	21.70

(Total diversions from Butte Creek and Hamlin Slough not to exceed 21.70 cfs).

FIGURE 5



SCHEMATIC DIAGRAM
OF BUTTE CREEK
WATERMASTER SERVICE AREA

Cow Creek Watermaster Service Area

The Cow Creek service area is located in Shasta County in the foothills east of Redding. There are 90 water right owners in the area with total allotments of 56.367 cubic feet per second. The major streams in this area are: North Cow Creek (commonly called Little Cow Creek), Cedar Creek (a tributary to North Cow), Oak Run Creek, and Clover Creek. These creeks, which are all tributaries of Cow Creek, flow in a westerly or southwesterly direction through narrow valleys joining Cow Creek near the town of Palo Cedro. The service area is located in the narrow valleys along the several creeks and consists of small parcels separated by brush-covered hills in the lower elevations. There are dense coniferous forests in the higher regions. The entire area is about 25 miles long by 10 miles wide and varies in elevation between about 500 and 4,000 feet.

A schematic drawing of each major stream system in the Cow Creek service area is presented as Figures 6 through 6c, pages 28 through 31.

Water Supply

Water supply for this service area is derived mostly from springs and seepage, with some early snowmelt runoff. A considerable portion of the watershed consists primarily of low brush hills which do not accumulate a heavy snowpack. Relatively large amounts of precipitation during the winter normally produce substantial springs and seepage that flow throughout the irrigation season.

Cedar Creek flow is usually sufficient to supply all allotments until about July 15. Thereafter, it steadily decreases throughout the remainder of the season.

The flow of North Cow Creek in average years is adequate to supply nearly 100 percent of all allotments. In dry years it is necessary to reduce allotments up to 50 percent during the latter part of the summer.

The flow of Oak Run Creek is augmented by a first priority allotment of five cubic feet per second of imported water from the North Cow Creek watershed. The combined flow is generally adequate to supply all allotments throughout the season.

Clover Creek produces enough water to meet nearly all allotments throughout the season. In dry years, diversions may be reduced to about 70 percent of decreed allotments.

Records of the daily mean discharge of North Cow Creek near Ingot are presented in Table 12. Numerous additional gaging stations were maintained in various diversion ditches.

TABLE 12
DAILY MEAN DISCHARGE
NORTH COW CREEK NEAR INGOT
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1				40	8.9	7.2	6.8
2				39	9.3	6.8	6.8
3				36	9.3	5.7	6.4
4				35	8.0	5.4	5.4
5				66	7.2	5.4	6.1
6				56	7.2	5.4	7.2
7				42	6.1	4.7	6.8
8				37	6.4	4.4	6.4
9				35	6.1	4.1	6.4
10				32	7.6	3.8	6.4
11				32	7.6	3.8	6.4
12				28	7.6	3.8	6.4
13				26	7.6	4.1	6.4
14				26	7.2	6.4	6.8
15				23	7.2	7.6	6.8
16				20	6.8	8.0	6.8
17				19	7.2	8.4	6.4
18				19	7.6	7.2	6.4
19				16	7.2	36	6.4
20				13	7.2	64	6.8
21				13	6.8	51	6.1
22				12	6.8	21	6.1
23			*72	12	6.1	15	6.1
24			65	11	6.4	12	6.1
25			70	11	6.4	10	5.4
26			65	9.3	6.1	11	5.4
27			58	8.9	6.1	10	5.0
28			54	8.9	6.1	8.4	5.0
29			49	8.4	6.4	7.2	4.7
30			44	9.3	6.8	6.8	4.7
31			41		6.8	6.8	
Mean			57.6	24.8	7.1	11.7	6.2
Runoff in acre-feet			1030	1480	437	717	367

* Beginning of record

Method of Distribution

Water in the Cow Creek service area is used for domestic and stockwatering purposes and for irrigation of meadow hay, alfalfa, small orchards, and vegetable gardens. The alfalfa and hay lands are irrigated primarily by wild flooding, although some sprinklers are used. Furrows are used for irrigating gardens, and basins or checks and sprinklers are used for orchards. Much of the water applied is lost by surface runoff or by deep percolation, some of which returns to the creeks and thereby becomes available for rediversion downstream.

Only one priority allotment was provided in each of the Cow Creek service area decrees (see Table 1) except for the Oak Run Creek decree which contains a surplus allotment.

1968 Distribution

Watermaster service began June 15 in the Cow Creek service area and continued until September 30. Ross P. Rogers, Water Resources Engineering Associate, was watermaster during this period.

The available water supply for the entire Cow Creek service area was considerably below average. Lack of precipitation during the late winter and early spring months contributed to a serious drought which existed most of the season.

An unusually heavy rainstorm of about three days duration began on August 18. The back of the drought was thus broken. Cooler temperatures prevailed throughout most of the remainder of the season. Although streamflows steadily decreased after the storm and were once again rationed, the extreme shortages did not recur. Most ranchers completed the irrigation season without further critical problems of water supply.

North Cow Creek. The water supply of North Cow Creek was well below average. An additional problem occurred, typical of dry years, to substantially deplete the supply. Prolonged high summer temperatures created excessive channel losses in the 25-mile length of canyon between Round Mountain and Bella Vista. This, combined with an already short water supply, created drought conditions until the mid-August rainfall.

Surplus water was available to all North Cow Creek users until about the third week in June. From that time until mid-August the supply receded steadily. It was able to serve about 80 percent of allotments during the middle and latter part of July, decreased to about 70 percent in early August, and had just been set at about 65 percent of allotments before rainfall began throughout the service area in mid-August.

Cedar Creek. In dry years, with all water right owners diverting, the water supply in Cedar Creek becomes extremely critical. Some lower users, because of evaporation and ditch loss, receive virtually no water at their place of use.

The water supply in 1968 was far below average. However, the Truman Ranch did not use its allotment. Consequently, the lowest water user on the creek received an adequate supply during most of the irrigation season.

Oak Run Creek. Oak Run Creek historically provides the best supply of all streams in the Cow Creek service area. The springs at its headwaters are not as severely affected in drought periods as those of neighboring streams.

Although all other creeks in the service area were well below average, the Oak Run Creek water users received a reasonable irrigation supply for most of the season. Close supervision of diversions and nonuse of allotments by some water right owners helped create this near-favorable condition. The August rainstorms helped replenish the streamflow and prevent a critical shortage from developing.

Clover Creek. The available supply on Clover Creek was well below average during most of the irrigation season. Excessive evaporation and conveyance losses occurred in the 20-mile length of canyon between the upper users near Oak Run and the lower users near Millville. This created unusually difficult problems in maintaining an equitable distribution of the water supply.

Some surplus water was available until late June. The streamflow then declined steadily until the mid-August rains. There was sufficient water available to supply about 90 percent of allotments during early July, about 85 percent during mid-July, and about 70 to 75 percent during late July and the first half of August. The heavy rains created surplus flow conditions during late August. Flows receded again in early September to about 90 percent of allotments. This level was maintained throughout the remainder of the irrigation season.

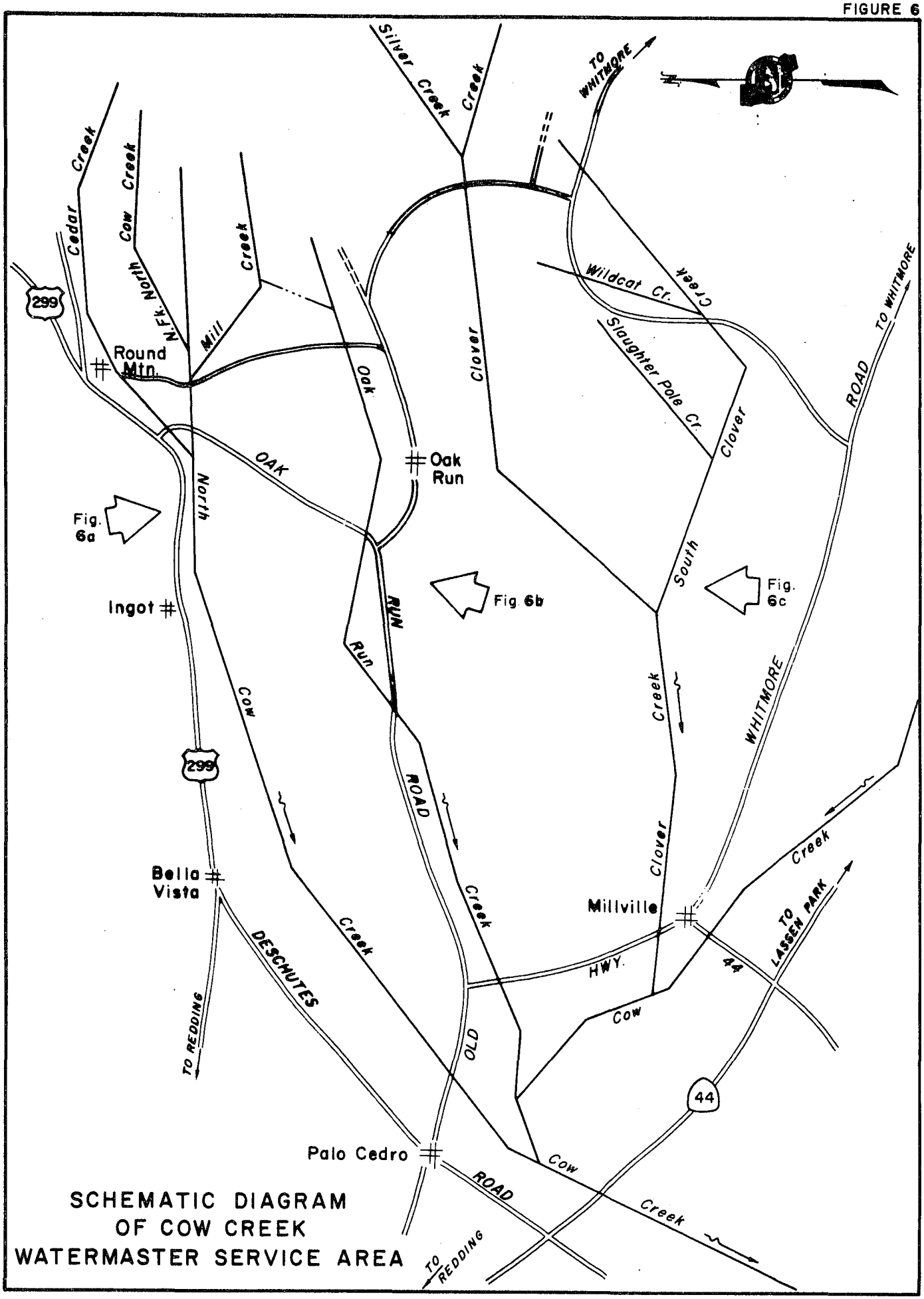
Special Occurrences

A combination measuring box and spill-back was constructed near the head of the Guttman Ditch on Clover Creek. Because of difficult access to this ditch, the structure was built using light-weight pumice blocks filled with reinforced concrete, and bonded together with masonry mortar.

A concrete diversion box was also constructed on the Guttman Ditch. This structure provides an automatic division of water at the two water users' ditch laterals.

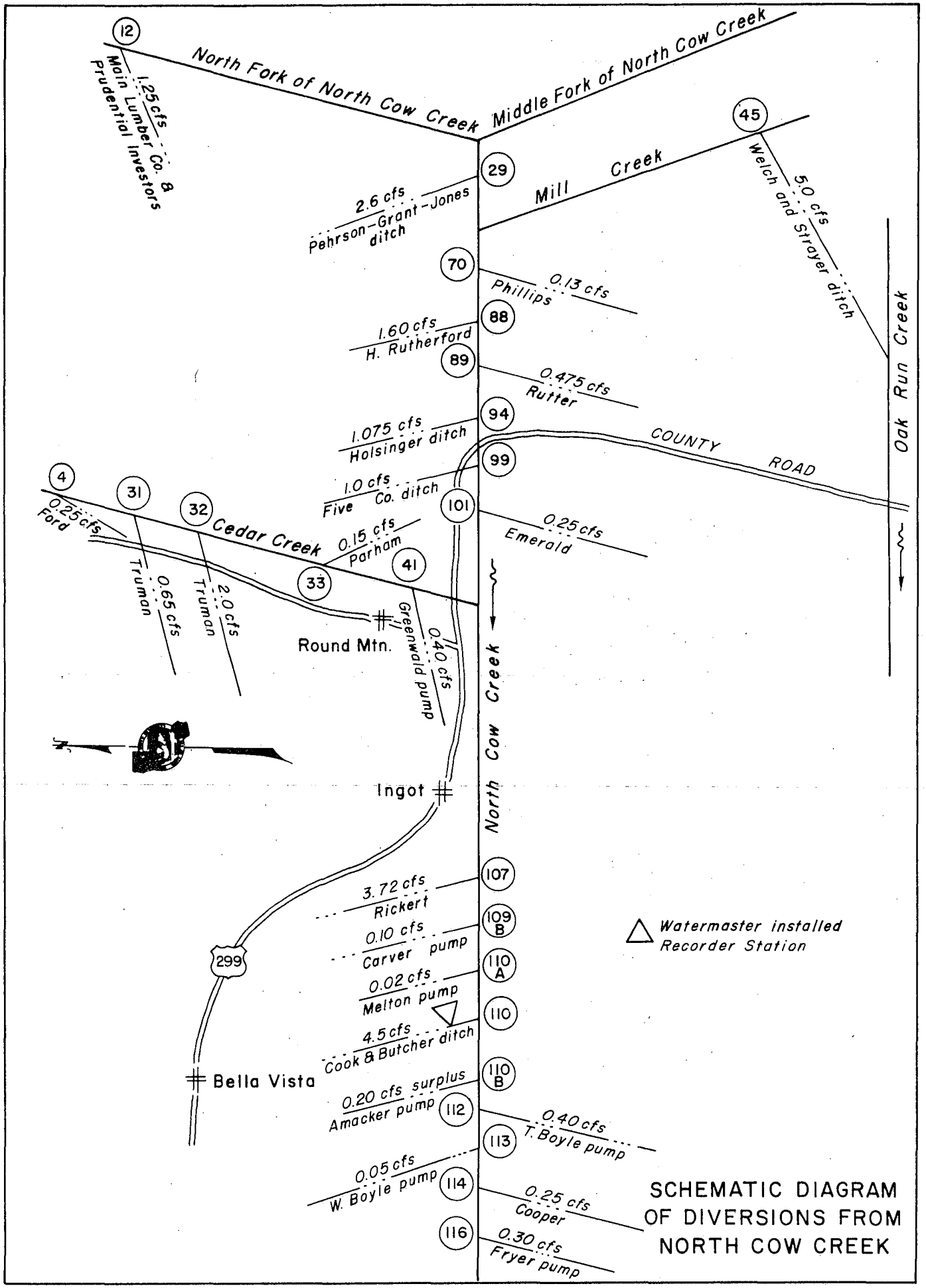
Plans for construction during the 1969 season include: North Cow Creek - two concrete Parshall flumes, a concrete spill-back, and a combination concrete measuring box and spill-back; Oak Run Creek - several diversion structures at ditch laterals; and Clover Creek - improvement of several existing diversion and spill-back structures.

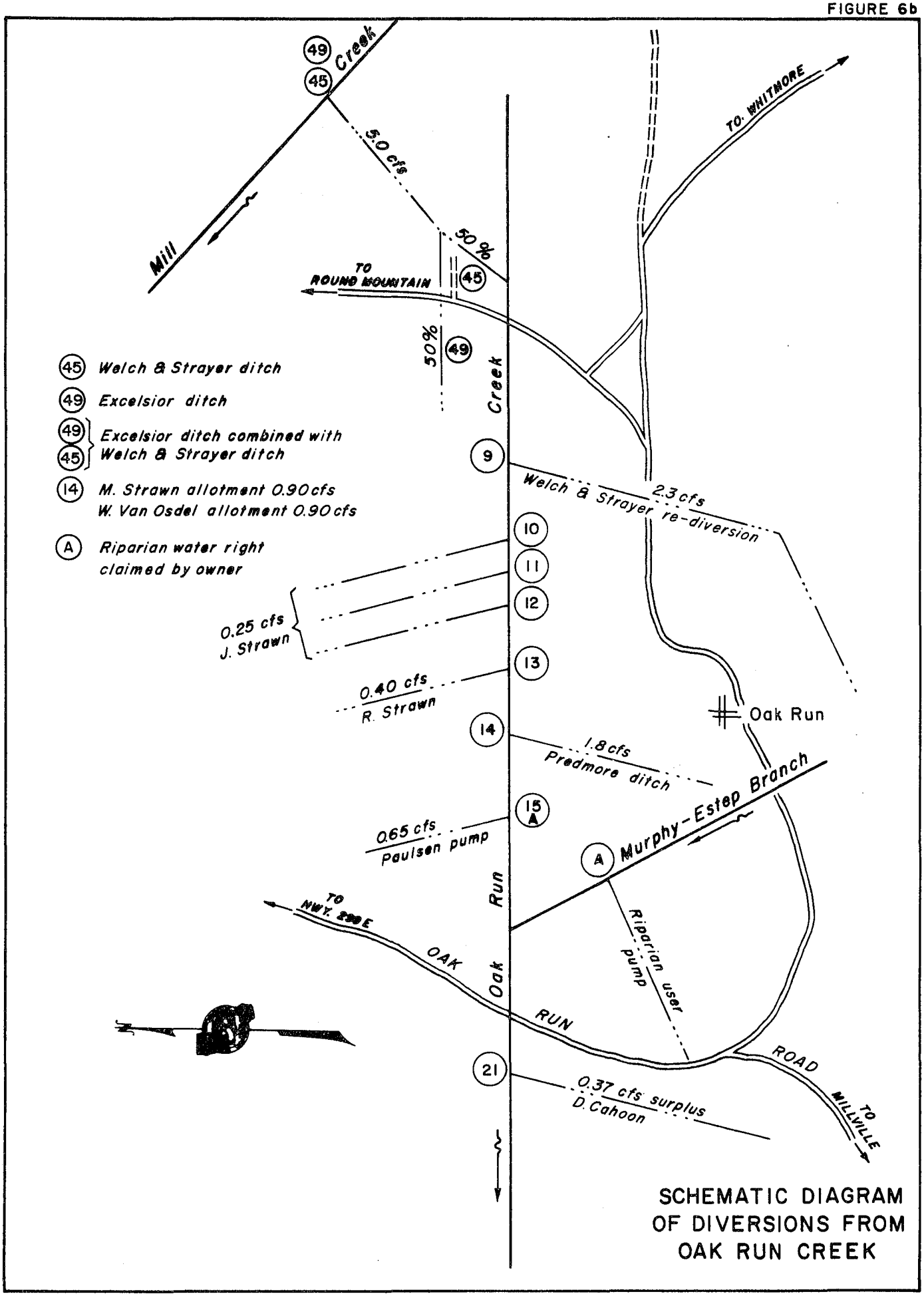
FIGURE 6



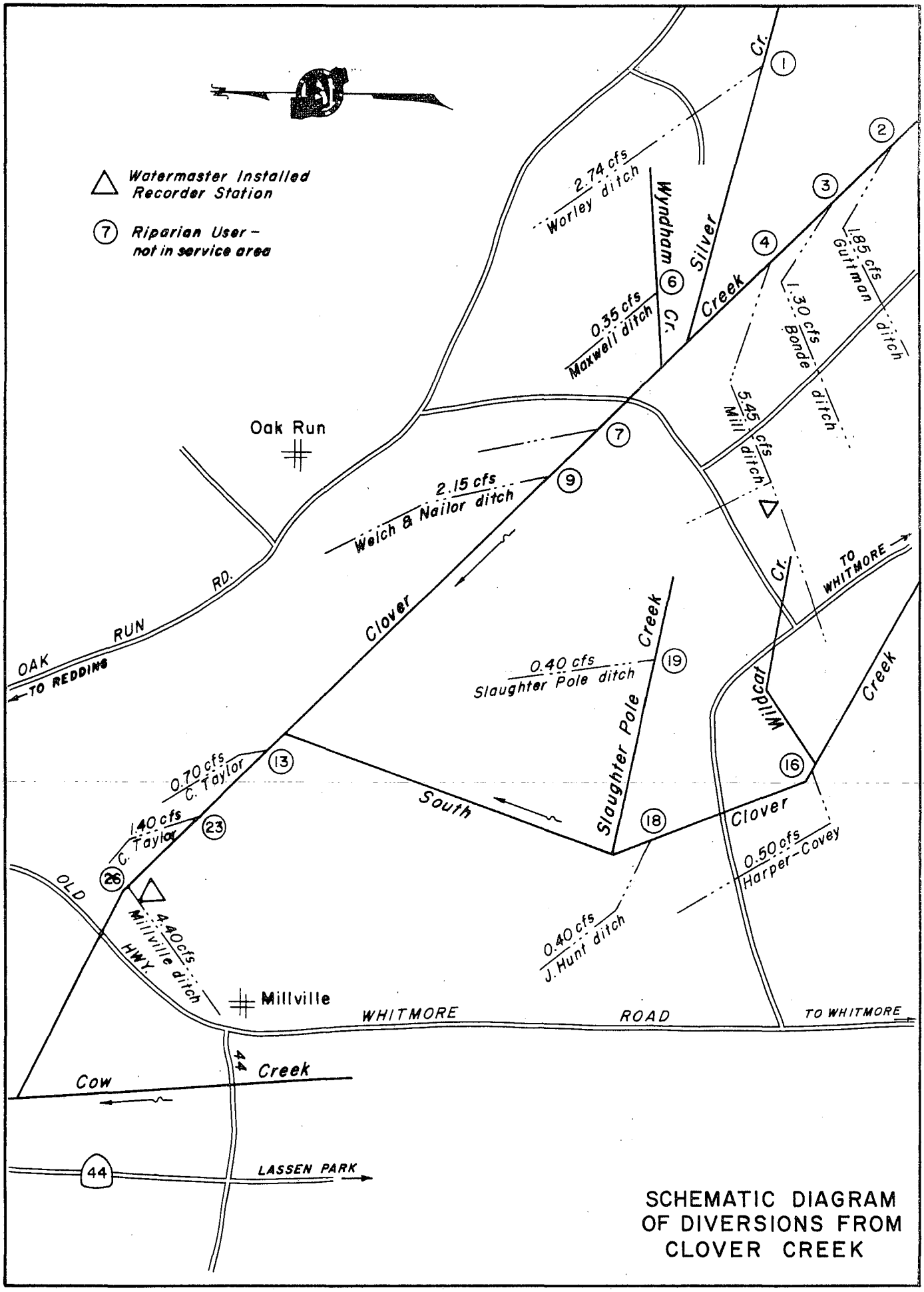
SCHEMATIC DIAGRAM
OF COW CREEK
WATERMASTER SERVICE AREA

FIGURE 6a


12
North Fork of North Cow Creek
Middle Fork of North Cow Creek
1.25 cfs
Main Lumber Co. & Prudential Investors
45
29
Mill Creek
Welch and Strayer ditch
5.0 cfs
2.6 cfs
Pehrson-Grant-Jones ditch
70
Phillips
0.13 cfs
88
1.60 cfs
H. Rutherford
89
0.475 cfs
Rutter
94
1.075 cfs
Holsinger ditch
COUNTY ROAD
99
Oak Run Creek
4
31
32
1.0 cfs
Five Co. ditch
101
0.25 cfs
Ford
Cedar Creek
0.15 cfs
Parham
0.25 cfs
Emerald
41
33
Truman
0.65 cfs
Truman
2.0 cfs
Round Mtn.
Greenwald pump
0.40 cfs
North Cow Creek
Ingot
107
3.72 cfs
Rickert
109 B
0.10 cfs
Carver pump
299
110 A
0.02 cfs
Melton pump
110
4.5 cfs
Cook & Butcher ditch
Bella Vista
110 B
0.20 cfs surplus
Amacker pump
112
0.40 cfs
T. Boyle pump
113
0.05 cfs
W. Boyle pump
114
0.25 cfs
Cooper
116
0.30 cfs
Fryer pump
Watermaster installed Recorder Station
SCHEMATIC DIAGRAM OF DIVERSIONS FROM NORTH COW CREEK



SCHEMATIC DIAGRAM OF DIVERSIONS FROM OAK RUN CREEK


Watermaster Installed Recorder Station
(7) Riparian User – not in service area
2.74 cfs Worley ditch
Wyndham Cr.
Silver Creek
0.35 cfs Maxwell ditch
1.30 cfs Bonde ditch
1.85 cfs Guttman ditch
5.45 cfs Mill ditch
Oak Run
2.15 cfs Welch & Nailor ditch
OAK RUN RD.
TO REDDING
Clover Cr.
TO WHITMORE
0.40 cfs Slaughter Pole ditch
Slaughter Pole Creek
Wildcat Creek
0.70 cfs C. Taylor
1.40 cfs C. Taylor
South Clover Creek
0.50 cfs Harper-Covey
OLD MILLVILLE HWY.
4.40 cfs Millville ditch
0.40 cfs J. Hunt ditch
Millville
WHITMORE ROAD
TO WHITMORE
Cow 44 Creek
44
LASSEN PARK
SCHEMATIC DIAGRAM OF DIVERSIONS FROM CLOVER CREEK

Digger Creek Watermaster Service Area

The Digger Creek service area is located in southeastern Shasta County and northeastern Tehama County. There are 35 water right owners in the area with total allotments of 23.225 cubic feet per second.

Digger Creek forms a portion of the boundary line between Shasta and Tehama Counties. It drains an area of approximately 45 square miles on the western slopes of mountains situated immediately west of Lassen National Park. The creek flows in a westerly direction through the town of Manton to its confluence with North Fork Battle Creek. Manton, the only community in the area, is located approximately 40 miles northeast of Red Bluff.

A schematic drawing of the Digger Creek stream system is presented as Figure 7, page 35.

Water Supply

Precipitation, occurring principally in the winter months, is typical of Northern California foothill areas. Snowmelt contributes to the early runoff but the summer streamflow is primarily from springs. In average runoff years there is sufficient flow in Digger Creek, with careful regulation, to satisfy all decreed allotments throughout the entire irrigation season. However, serious deficiencies occur in dry years.

The estimated daily mean discharge of Digger Creek below South Fork Branch is presented in Table 13.

TABLE 13
DAILY MEAN DISCHARGE
DIGGER CREEK BELOW SOUTH FORK BRANCH
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1					21*	15	14
2					20	15	14
3					20	14	14
4					20	14	14
5					20	14	14
6					20	13	14
7					19	13	14
8					19	13	14
9					19	13	14
10					19	13	14
11					19	13	14
12					18	13	14
13					18	14	14
14					18	14	16
15					18	14	15
16					18	17	14
17					18	15	13
18					18	15	13
19					17	25	13
20					17	23	13
21					17	28	13
22					17	20	13
23					17	17	13
24					17	16	13
25					17	14	13
26					16	14	13
27					16	14	12
28					16	14	12
29					16	14	12
30					15	14	12
31					15	14	
Mean					17.9	15.5	13.5
Runoff in acre-feet					1100	950	803

* Beginning of Record

Method of Distribution

There are four court decrees (see Table 1) on Digger Creek. These decrees, in effect, have divided the water rights on the creek into two groups, the upper users and the lower users. The three upper users irrigate lands adjoining the stream so that all water not consumptively used returns to Digger Creek. The lower users are located within a three-mile reach of the stream and within a five-square-mile area. Very little runoff from the lower users returns to the creek.

The three upper users' water rights are absolute and not correlative to the lower users; therefore, allotments are not cut proportionally as Digger Creek flows decrease. Since the lower users have to stand all deficiencies, their allotments are cut proportionally as the flow decreases. In effect, the upper users have first priority allotments and the lower users have second priority allotments.

Irrigation is accomplished principally by wild flooding, although border

checks and sprinklers are used on a few fields. Small diversion dams are placed in the stream channel to divert water into ditches for conveyance to the fields.

1968 Distribution

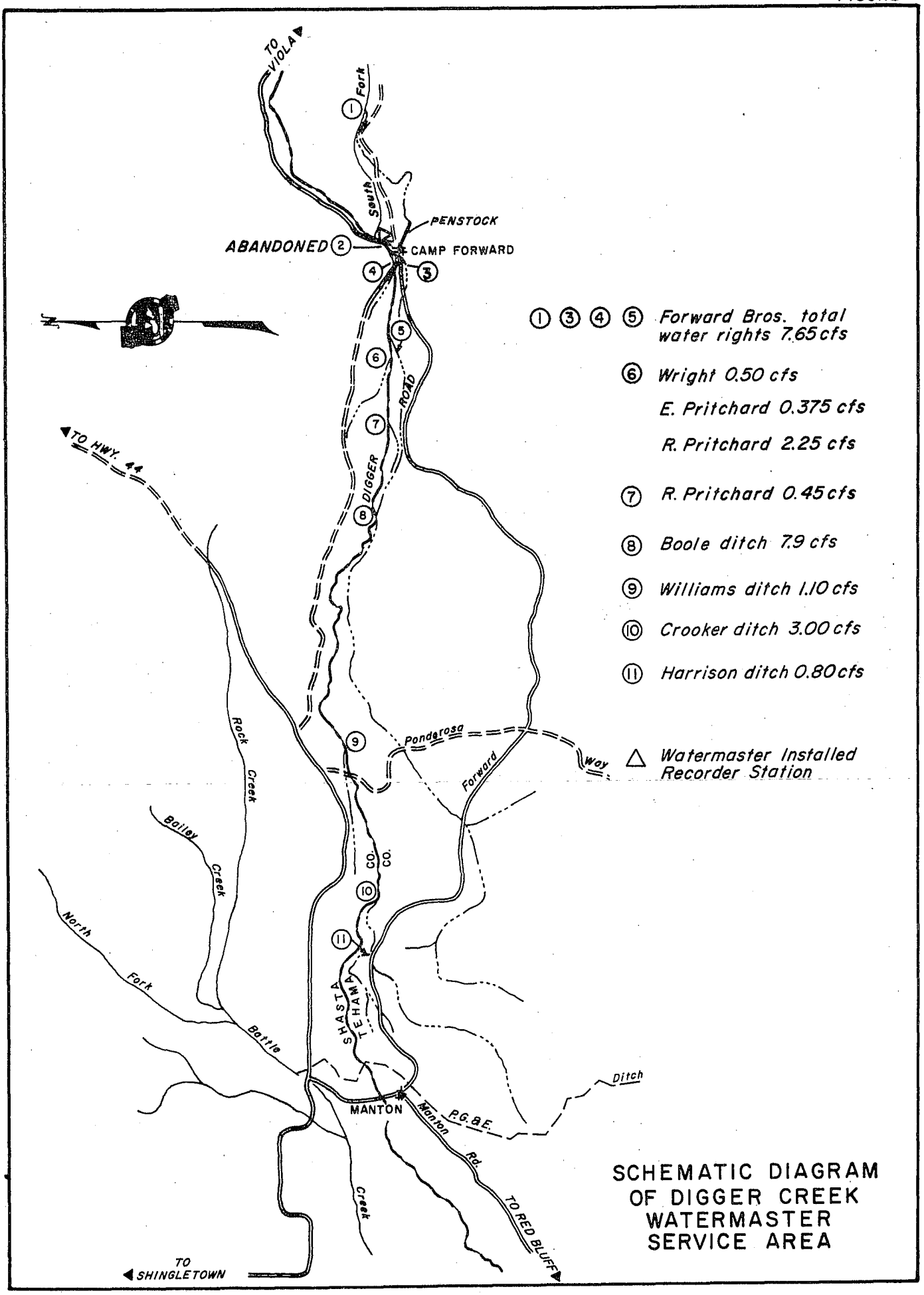
Watermaster service began July 1 in the Digger Creek service area and continued until September 30. Ross P. Rogers, Water Resources Engineering Associate, was watermaster during this period.

The available water supply in Digger Creek was far below average. The upper users, because of a superior priority, were entitled to 100 percent of their allotments throughout the season. The lower users, however, suffered from a deficient supply beginning in early July. They received about 80 percent of their allotments during late July. Their diversions were further reduced to about 65 percent of allotments during the first half of August.

Heavy rains in the third week in August weakened what might have become one of the worst drought years in recent history. Although the streamflow decreased rapidly after the storm, sufficient relief had been achieved. Many pastures were saved from drying out completely.

Percentage of allotments available to the lower users for the remainder of the season were: about 85 during late August and early September; 60 to 65 during mid-September, and about 80 to 85 during the last half of September. A few rain showers, combined with the normal decrease in evaporation and conveyance losses late in the season, accounted for the slightly increased water supply.

FIGURE 7



SCHEMATIC DIAGRAM OF DIGGER CREEK WATERMASTER SERVICE AREA

Hat Creek Watermaster Service Area

The Hat Creek service area is located in the eastern part of Shasta County north of Lassen Volcanic National Park. There are 47 water right owners in the area with total allotments of 135.545 cubic feet per second. Hat Creek, which flows in a northerly direction through the area, is the only source of water supply in the service area. The place of use is Hat Creek Valley, which is approximately 20 miles long and two miles wide. The valley extends northward from a point about three miles south of the town of Old Station, to the confluence of Rising River and Hat Creek. The irrigable lands, which consist primarily of volcanic ash, are interlaced with large outcroppings of volcanic rock.

Schematic drawings for both the upper and lower users' diversion systems from Hat Creek are presented as Figures 8 through 8b, pages 39 through 41.

Water Supply

The water supply of Hat Creek is derived from snowmelt runoff on Mount Lassen and from large springs. Snowmelt normally creates a high flow during May and June; however, the substantial portion of supply during the summer months comes from large springs which decrease only slightly in output. Only after a series of dry years does the flow of these springs fall much below 75 percent of total allotments.

A record of the daily mean discharge of Hat Creek near the town of Hat Creek is presented in Table 14.

HAT CREEK WMSA

TABLE 14
DAILY MEAN DISCHARGE
HAT CREEK NEAR HAT CREEK
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	155	149	163	176	127	130	116
2	153	148	164	183	129	130	117
3	152	144	167	184	128	130	117
4	152	146	172	181	126	130	117
5	154	146	168	180	127	129	117
6	150	144	158	177	127	129	116
7	149	144	157	171	126	129	115
8	149	144	158	163	123	128	121
9	147	146	162	155	123	121	126
10	146	150	166	152	131	117	126
11	146	155	171	150	137	116	124
12	146	158	179	146	137	116	124
13	144	155	183	143	136	118	126
14	146	154	164	143	136	118	127
15	144	153	158	144	136	118	126
16	146	148	162	146	135	122	124
17	144	144	167	146	135	120	124
18	142	141	170	144	134	118	121
19	141	141	184	144	134	131	116
20	142	135	206	150	126	132	116
21	142	136	184	152	122	131	116
22	142	136	175	152	121	124	116
23	142	135	167	150	121	121	116
24	142	135	157	148	121	122	116
25	146	137	158	146	120	126	115
26	143	140	160	147	119	126	114
27	143	144	166	146	118	124	113
28	143	147	167	144	118	123	119
29	144	155	172	143	118	119	122
30	147	160	171	132	127	116	122
31	147		170		130	116	
Mean	146	146	169	155	127	124	120
Runoff in acre-feet	8980	8670	10370	9200	7830	7600	7110

Method of Distribution

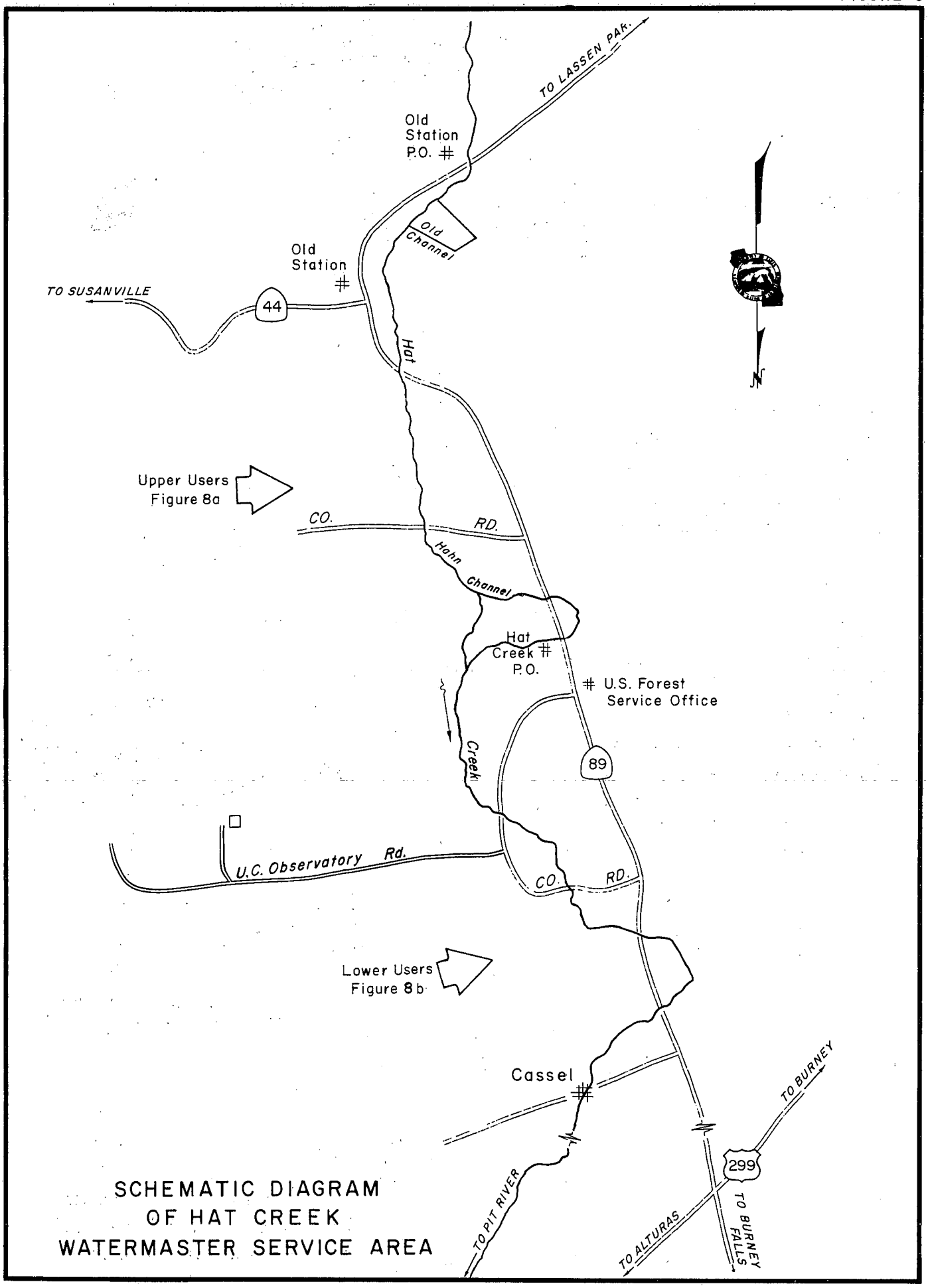
The Hat Creek decree (see Table 1) divides the water rights on Hat Creek into two groups (upper users and lower users) who use the water on 10-day rotation schedules, with one priority class for each group as the basis for distribution. Therefore, a complete reregulation of all diversions occurs every 10 days, alternating an irrigation supply to one group and a minimum flow (stockwater) to the other group.

Most irrigation in the area is accomplished by wild flooding. Large heads of water are used to cover the land rapidly, thereby preventing excessive loss from percolation in the extremely porous soil. Diversion dams constructed across the creek serve to divert water into large ditches. The fields, many of which have checks and borders, are then flooded from the main diversion ditch or from laterals. A few domestic rights are met by pumping directly from Hat Creek.

1968 Distribution

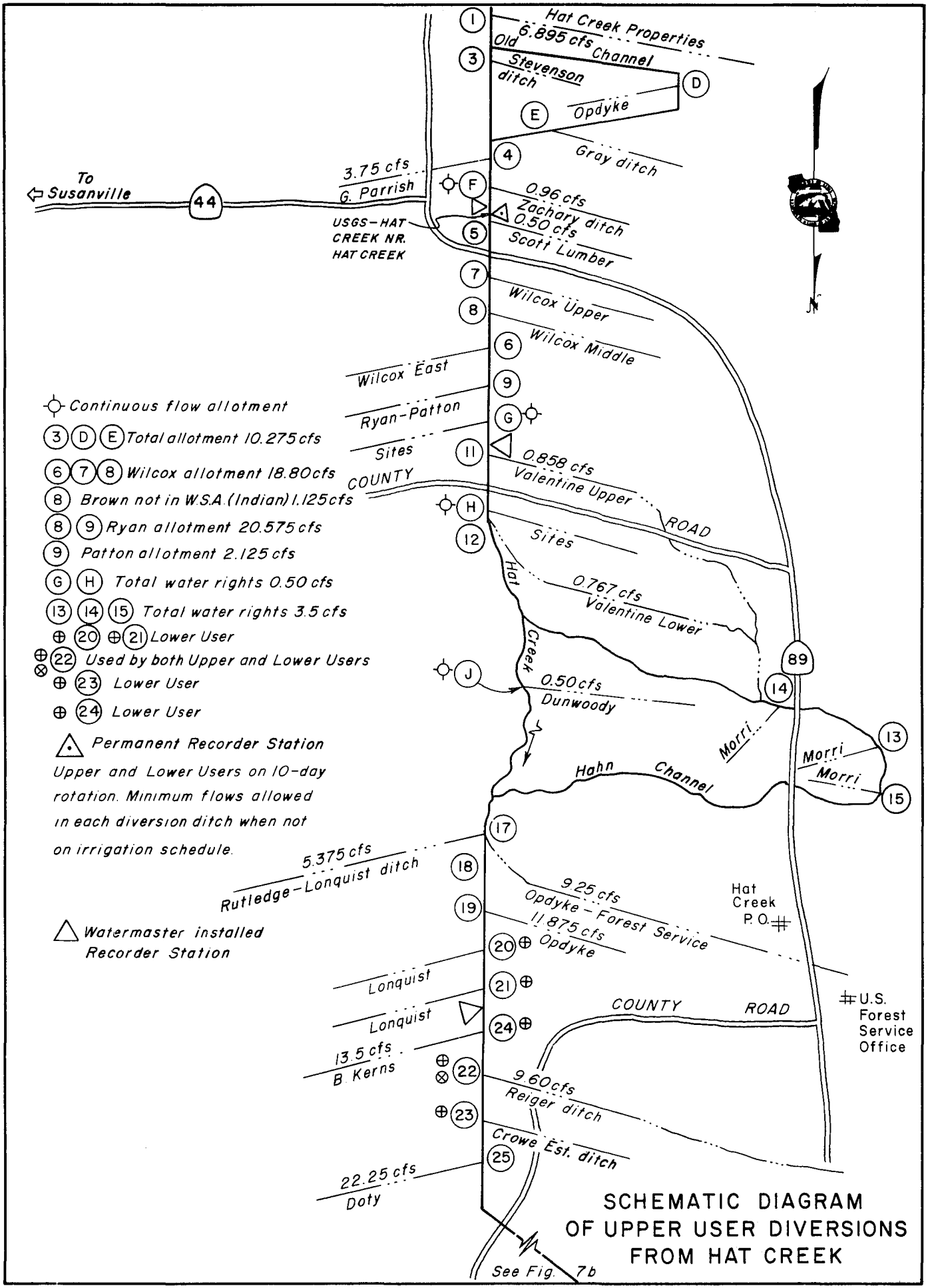
Watermaster service began May 1 in the Hat Creek service area and continued until September 30. Virgil D. Buechler, Water Resources Technician II, was watermaster during this period.

The available water supply in Hat Creek flowed at approximately 100 percent of decreed water rights through June 20. The 10-day rotation schedule was in effect from the start of watermaster service. The first reduction in allotments occurred on June 20 when the lower users were regulated to 90 percent. The creek then gradually decreased until August 19, when the creek reached its low for the summer of 119 cubic feet per second, or 75 percent of the lower users water rights. On August 20 a storm raised the flow to approximately 165 cubic feet per second, which is slightly more than the lower users' decreed rights. The creek then again gradually receded until by the end of the watermaster season the lower users were regulated to 80 percent of their allotments.

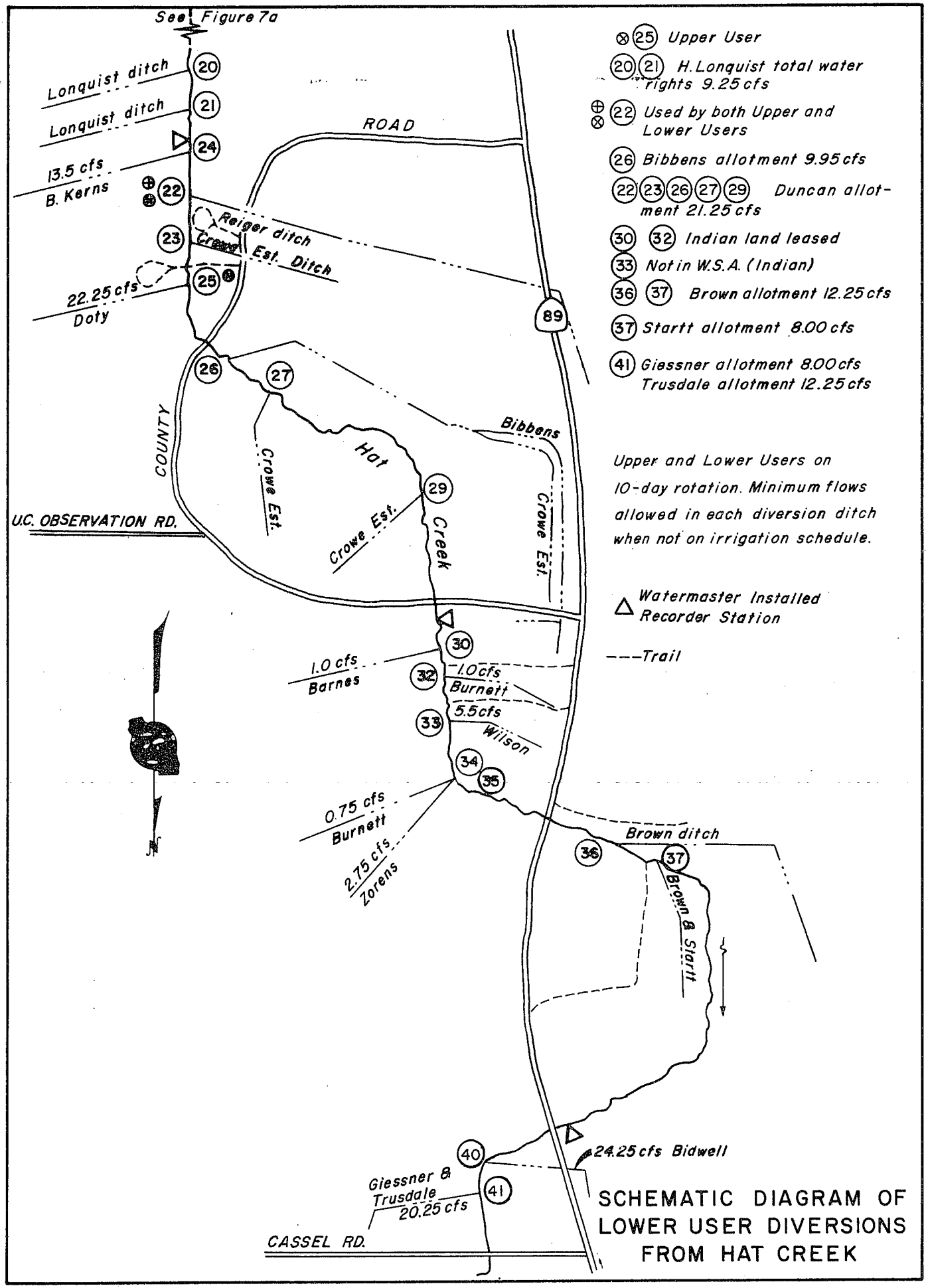


SCHEMATIC DIAGRAM
OF HAT CREEK
WATERMASTER SERVICE AREA

FIGURE 8a



SCHEMATIC DIAGRAM OF UPPER USER DIVERSIONS FROM HAT CREEK


See Figure 7a
Lonquist ditch
Lonquist ditch
13.5 cfs
B. Kerns
ROAD
Reiger ditch
Crowe Est. Ditch
22.25 cfs
Doty
89
COUNTY
Crowe Est.
Hat
Creek
Crowe Est.
Crowe Est.
Bibbens
U.C. OBSERVATION RD.
1.0 cfs
Barnes
1.0 cfs
Burnett
5.5 cfs
Wilson
0.75 cfs
Burnett
2.75 cfs
Zorens
Brown ditch
Brown & Startt
24.25 cfs Bidwell
Giessner & Trusdale
20.25 cfs
CASSEL RD.
Upper User
H. Lonquist total water rights 9.25 cfs
Used by both Upper and Lower Users
Bibbens allotment 9.95 cfs
Duncan allotment 21.25 cfs
Indian land leased
Not in W.S.A. (Indian)
Brown allotment 12.25 cfs
Startt allotment 8.00 cfs
Giessner allotment 8.00 cfs
Trusdale allotment 12.25 cfs
Upper and Lower Users on 10-day rotation. Minimum flows allowed in each diversion ditch when not on irrigation schedule.
Watermaster Installed Recorder Station
Trail
SCHEMATIC DIAGRAM OF LOWER USER DIVERSIONS FROM HAT CREEK

Indian Creek Watermaster Service Area

The Indian Creek service area is located in the north central part of Plumas County in the vicinity of the town of Greenville. There are 43 water right owners in the service area with total allotments of 97.015 cubic feet per second. The major sources of supply in the service area are Indian Creek and two major tributaries, Wolf Creek and Lights Creek. Indian Creek and its minor tributaries rises in the mountains east of the service area. It then flows through Gennessee Valley and through Indian Valley past the towns of Taylorsville and Crescent Mills to its confluence with the North Fork Feather River. Indian Creek is joined from the north by Lights Creek and Wolf Creek in the northwest part of the valley. The major place of use is in Indian Valley, which is about four miles long and two and one-half miles wide. The average elevation is about 3,500 feet.

A schematic drawing of each major stream system within the Indian Creek service area is presented as Figures 9 through 9c, pages 45 through 48.

INDIAN CREEK WMSA

TABLE 15
DAILY MEAN DISCHARGE
INDIAN CREEK NEAR TAYLORSVILLE

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12			NO RECORD AVAILABLE				
13			FOR 1968 SEASON				
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Mean							
Runoff in acre-feet							

Water Supply

The water supply in the Indian Creek service area is derived primarily from snowmelt runoff with springs and seepage maintaining some late summer flow. The flow of Wolf Creek is normally sufficient to supply all allotments until June 1, while Indian and Lights Creeks, with the exception of some tributaries, have sufficient flow to supply all allotments until July 1. After these dates, the flow steadily decreases throughout the season until by the end of August only a small portion of allotments is available.

A record of the daily mean discharge of Indian Creek near Taylorsville is presented in Table 15.

Method of Distribution

The basic method of irrigation in Indian Valley is wild flooding. Small diversion dams are placed in the stream channels to divert the water into distribution ditches for conveyance to the fields. Small check dams, located throughout the fields in swales, help to spread the water over the ground. There is a limited amount of check and border irrigation in the valley. A few sprinkling systems are also in use.

The Indian Creek decree (see Table 1) establishes three priority classes for each of the major stream systems within the Indian Creek service area.

1968 Distribution

Watermaster service began in the Indian Creek service area on April 22 and continued until September 30. Harvey M. Jorgensen, Water Resources Engineering Associate, was the watermaster during this period.

An average water supply existed in the service area during the 1968 season.

Wolf Creek. The available water supply of Wolf Creek was sufficient to satisfy all allotments (three priorities) until July 15. The streamflow gradually decreased until only first priority allotments were being served on August 1.

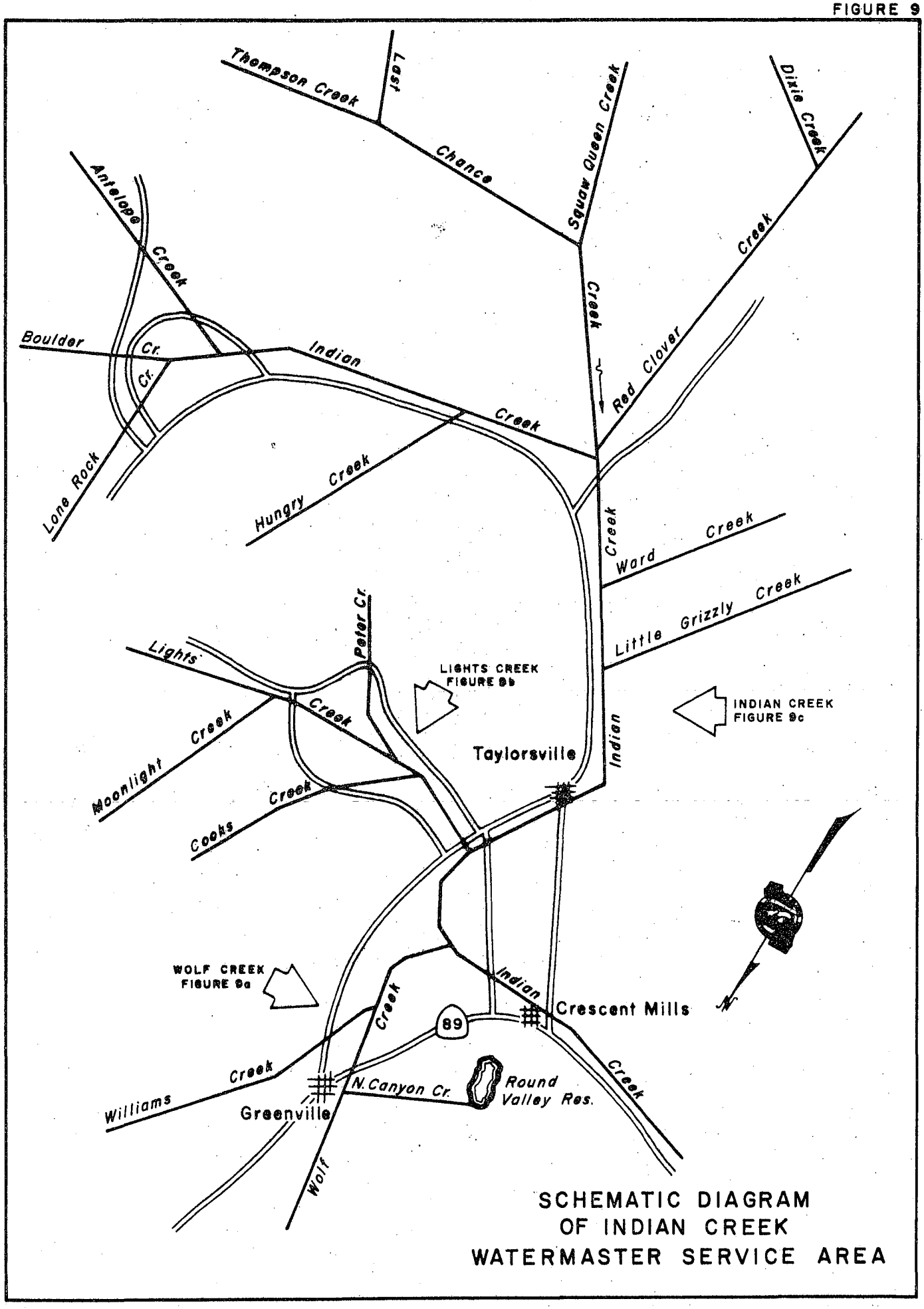
Lights Creek and Tributaries. The water supply of Lights Creek was sufficient to satisfy all allotments until July 1. The streamflow then steadily decreased until the stream was dry on July 10.

The available water supply of Cooks Creek satisfied all allotments until July 10.

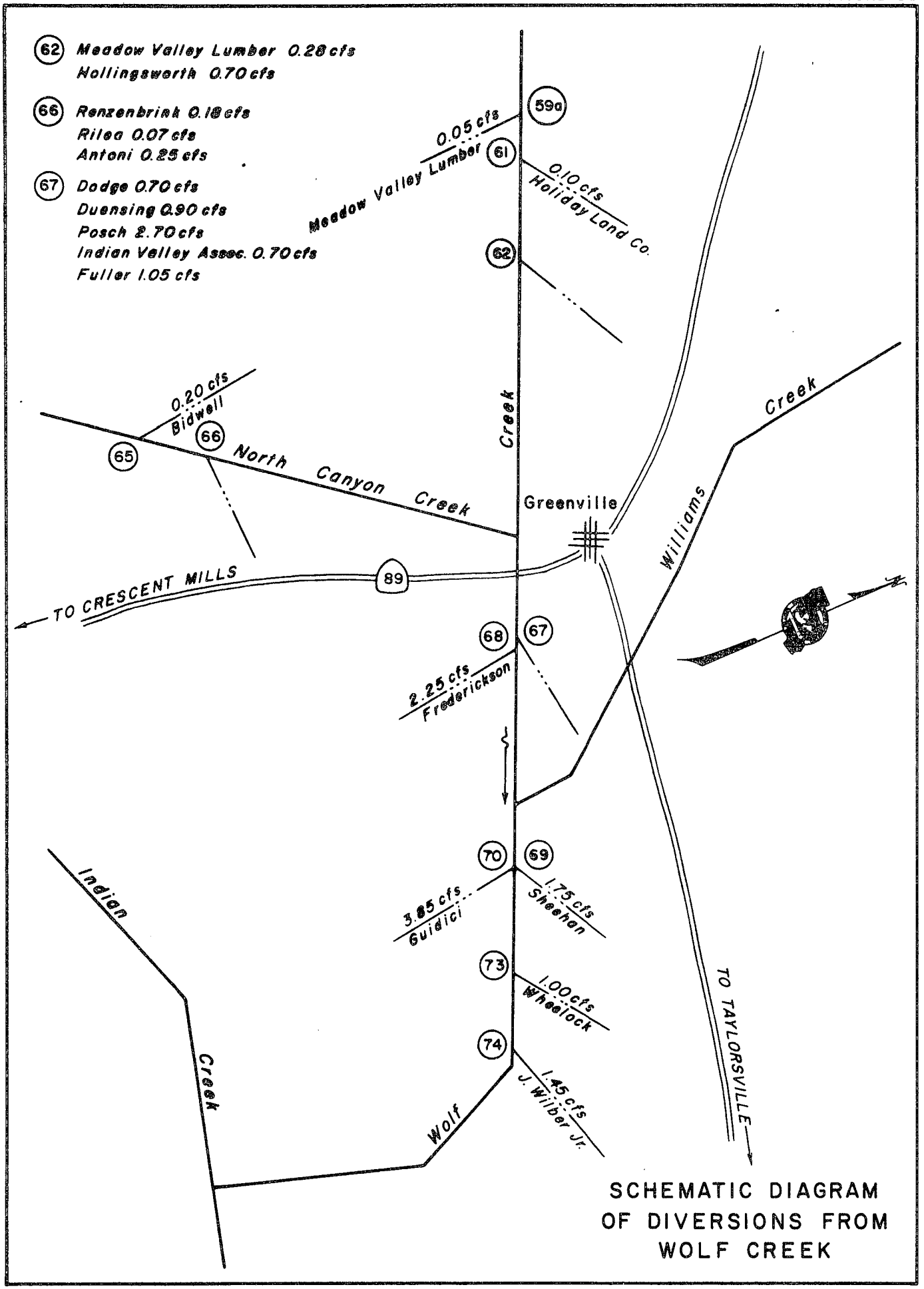
Indian Creek. The flow of Indian Creek was sufficient to satisfy all allotments until July 1. Sufficient underflow below the Mill Race Diversion Dam occurred to meet the allotments of the downstream users.

Special Occurrences

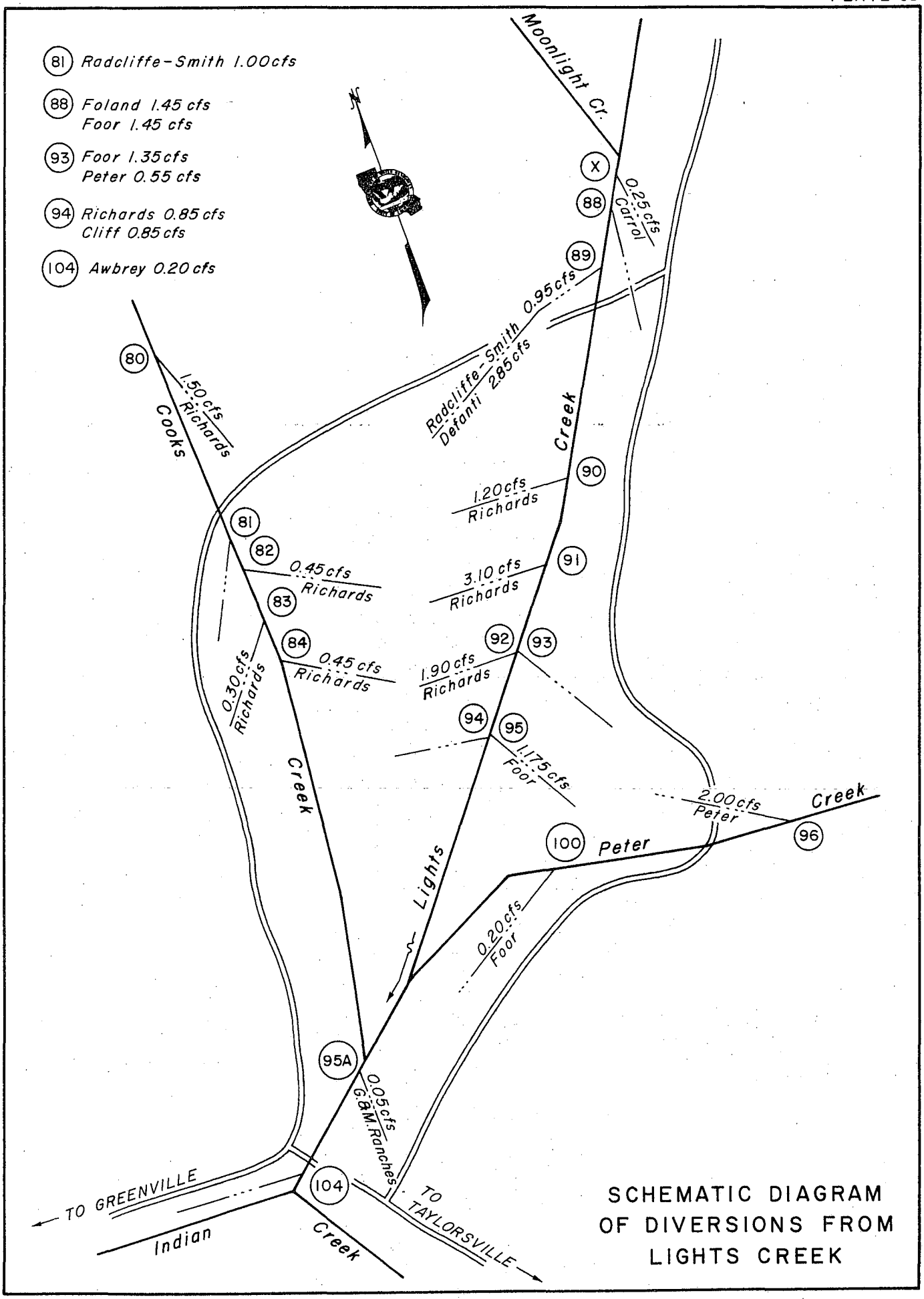
During the 1968 watermaster season, control devices were installed in diversions 36, 54 and 55 to facilitate the routing of project water from Antelope Lake past these points of diversion.

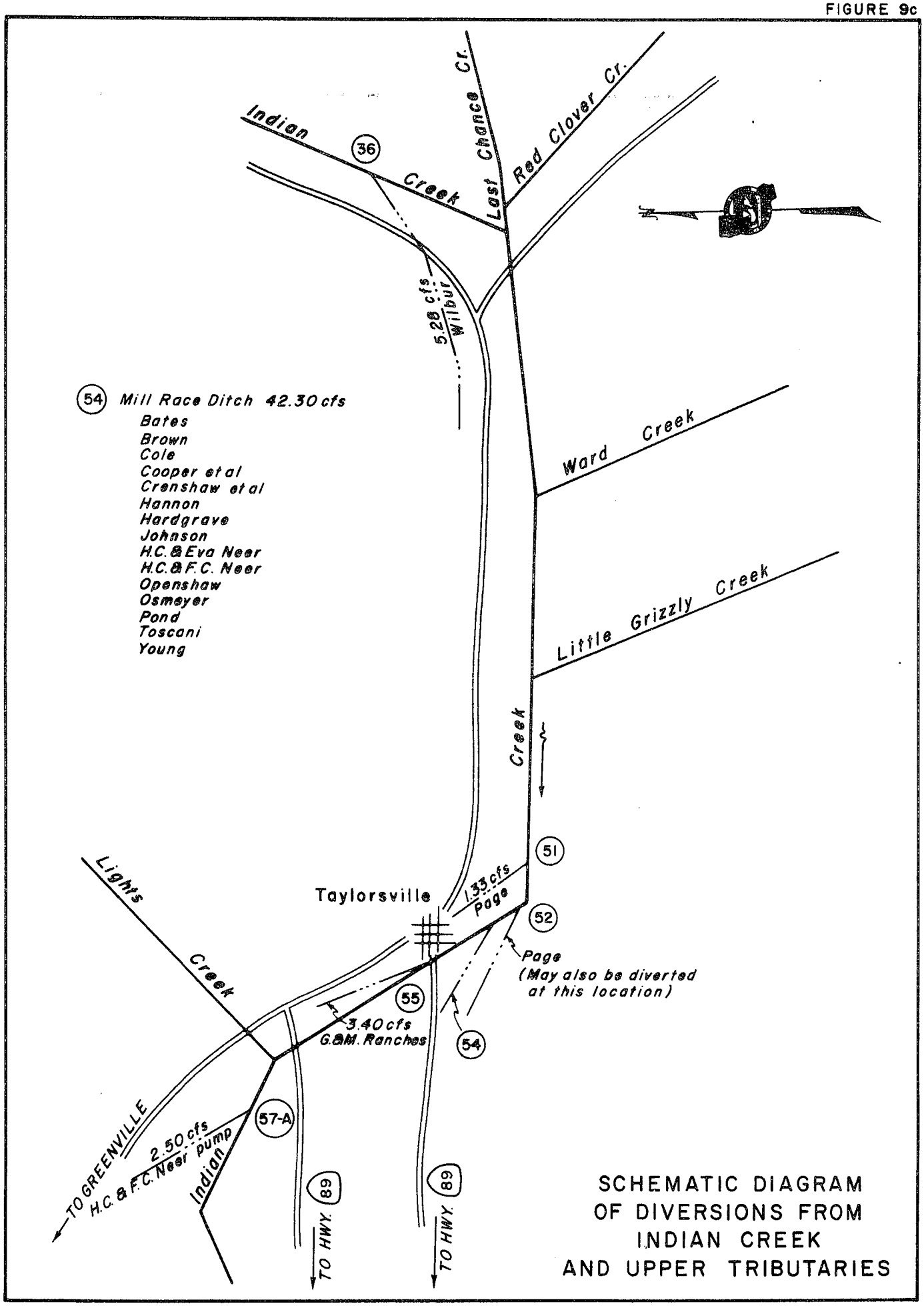


SCHEMATIC DIAGRAM
OF INDIAN CREEK
WATERMASTER SERVICE AREA



SCHEMATIC DIAGRAM OF DIVERSIONS FROM WOLF CREEK


(81) Radcliffe-Smith 1.00cfs
(88) Foland 1.45 cfs
Foor 1.45 cfs
(93) Foor 1.35cfs
Peter 0.55 cfs
(94) Richards 0.85 cfs
Cliff 0.85 cfs
(104) Awbrey 0.20 cfs
Moonlight Cr.
X
88
0.25 cfs Carrol
89
Radcliffe-Smith 0.95cfs
Defanti 2.85cfs
80
1.50 cfs Richards
Cooks Creek
Creek
90
1.20cfs Richards
81
82
0.45cfs Richards
91
3.10 cfs Richards
83
84
0.45 cfs Richards
92
93
1.90 cfs Richards
0.30 cfs Richards
94
95
1.175 cfs Foor
Creek
2.00 cfs Peter
Creek
96
100 Peter
Lights
0.20 cfs Foor
95A
0.05 cfs G.&M. Ranches
104
TO GREENVILLE
Indian Creek
TO TAYLORSVILLE
SCHEMATIC DIAGRAM OF DIVERSIONS FROM LIGHTS CREEK



SCHEMATIC DIAGRAM OF DIVERSIONS FROM INDIAN CREEK AND UPPER TRIBUTARIES

Middle Fork Feather River Watermaster Service Area

The Middle Fork Feather River service area is located in the plateau area on the west slope of the Sierra Nevada in the eastern portions of Sierra and Plumas Counties. There are 94 water right owners with total allotments of 370.865 cubic feet per second.

Major sources of supply for this service area are the Middle Fork Feather River and its tributaries in the Sierra Valley. The area is comprised of five major stream groups. These groups, starting in the north and east corner of the valley and proceeding in a southerly and westerly direction, are Little Last Chance Creek, Smithneck Creek, Webber Creek and tributaries, West Side Canal, and Fletcher Creek. The Middle Fork Feather River channel flows in a general northerly direction for approximately 20 miles through Sierra Valley. It then flows in a westerly direction. The major place of use is in Sierra Valley, which is about 15 miles long and 10 miles wide. The average elevation of the valley floor is 4,900 feet.

A schematic drawing of the Middle Fork Feather River service area is presented as Figure 10, page 52.

Water Supply

The major water supply in the Middle Fork Feather River service area is derived from snowmelt runoff, with minor flow from springs and from supplemental stored and foreign water.

Natural flows of Little Last Chance Creek are supplemented by reservoir storage provided by Frenchman Dam which was constructed by the Department of Water Resources in 1961. Stored water is released and used as needed under the provisions of an annual contract. Smithneck Creek flow is normally sufficient to supply all allotments until about the middle of May. It then decreases rapidly until about June 1. Only first and second priority allotments are then available for the remainder of the season.

The natural flow of Webber Creek is normally sufficient to supply all allotments until the middle of May. At that time up to 60 cubic feet per second is diverted from Little Truckee River to supplement the flow. This imported water is diverted through the Little Truckee Ditch into Cold Stream and then into Webber Creek for use of shareholders in the Sierra Valley Water Company. This supplemental supply decreases rapidly during July, producing only a small quantity during the latter part of the season. The West Side Canal streams normally supply all allotments until the first part of June. The flow then gradually declines throughout the season.

The flow of Fletcher Creek and Spring Channels normally supplies all allotments until July 1. The flow then gradually declines for the remainder of the season.

Records of the daily mean discharge of several stream gaging stations in the Middle Fork Feather River service area are presented in Tables 16 and 17, page 51.

Method of Distribution

Wild flooding is employed by the majority of the water users to irrigate their fields. Small diversion dams are placed in the stream channels to divert the water into individual distribution systems. Check dams are constructed in the swales to implement flooding once the water reaches the fields.

The Middle Fork Feather River decree (see Table 1) establishes the number

of priority classes for each of the major stream systems within the Middle Fork Feather River service area as follows: Little Last Chance Creek - five; West Side Canal Group - five; Fletcher Creek and Spring Channels - three; Sierra Valley Water Company - one; Webber Creek and tributaries - six; and Smithneck Creek - five.

1968 Distribution

Watermaster service began April 1 in the Middle Fork Feather River service area and continued until September 30. Joe Nessler, Water Resources Engineering Associate, was supervising watermaster during this period. Conrad Lahr, Water Resources Technician II, assisted as deputy watermaster.

A below-average water supply existed in the service area during the 1968 season.

Little Last Chance Creek. Frenchman Dam and Reservoir began its seventh season of operation in 1968. Agreements concerning storage and distribution were again negotiated with the users in this stream system. Procedures and specific details of distribution and operation are covered in a separate report prepared by the Operations Section of the Central District.

West Side Canal Group. The West Side Canal Group, consisting of Hamlin, Miller, and Turner Creeks, received a sufficient water supply to satisfy all allotments (five priorities) until June 15. At this time a three-week rotation schedule was started for the water users below Highway 49-89 on Turner Creek with enough water to supply first and second priorities. The water supply continued to drop until the first and only half of the second priority allotments were available by the end of the season.

Fletcher Creek and Spring Channels. The available water supply was sufficient to satisfy all allotments until about June 1. By the end of the season the flow had dropped off to supply only first priority allotments.

The Sierra County Water Works District diverted from Fletcher Creek an average of 0.05 cubic feet per second over a 62-day period of record starting July 10, 1968, and ending September 10, 1968.

Sierra Valley Water Company. The Little Truckee Ditch conveyed 7651 acre-feet of water to the Sierra Valley Water Company from April 29 through September 30, 1968. Water was distributed to shareholders in accordance with schedule 9 of the Middle Fork Feather River decree.

Webber Creek and Tributaries. The natural flow of Webber Creek was sufficient to supply all allotments (six priorities) until about May 1. Combined with the water imported from the Little Truckee River, beginning May 2, 1968, the total supply was sufficient to satisfy all allotments of the Sierra Valley Water Company shareholders until mid-June. The natural flow decreased gradually so that only first priority allotments were being served at the end of the season.

Smithneck Creek. The available water supply on Smithneck Creek was sufficient to satisfy all allotments (five priorities) until the latter part of April. A two-week rotation schedule was started May 1 by users below Loyalton. The flow was still insufficient by the first of July so rotation was continued. Only first priority water was available by the end of the season.

TABLE 16
DAILY MEAN DISCHARGE
LITTLE [illegible] RIVER AT MEAD
March through September 1968
(In second-feet)

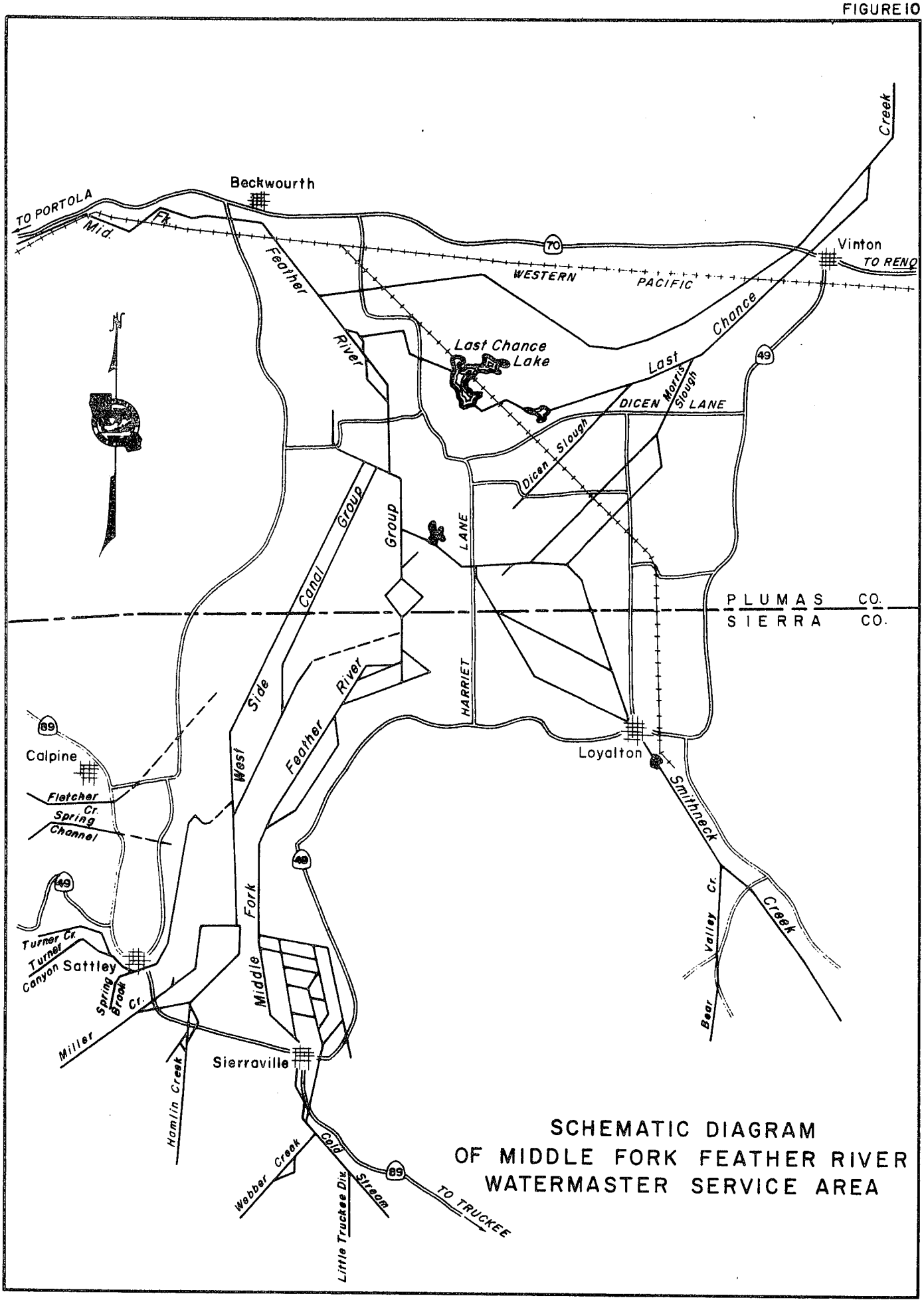
Day	March	April	May	June	July	August	September
1			0.5	61	27	4.0	2.0
2			25	61	27	3.0	1.8
3			49	61	25	2.9	1.8
4			53	60	22	2.6	1.8
5			54	60	21	2.6	1.8
6			47	60	20	2.4	1.7
7			44	60	18	2.4	1.7
8			44	60	16	2.4	1.7
9			54	60	15	2.2	1.7
10			60	60	13	2.2	1.5
11			60	59	12	2.0	1.5
12			60	59	11	1.5	1.5
13			60	59	10	1.5	1.5
14			60	61	9.8	1.5	1.5
15			60	61	9.2	1.7	1.5
16			61	61	9.2	1.7	1.5
17			61	61	8.6	1.7	1.5
18			60	61	7.6	1.8	1.5
19			61	61	7.0	12	1.5
20			62	61	6.2	8.6	1.7
21			61	61	5.4	4.4	1.7
22			61	61	4.9	3.7	1.7
23			61	61	4.2	3.3	1.7
24			60	57	4.0	2.9	1.5
25			60	52	3.7	2.6	1.5
26			61	46	3.5	2.4	1.5
27			61	42	3.3	2.4	1.5
28			61	37	3.0	2.2	1.5
29		0.3*	61	32	3.0	2.2	1.5
30		0.5	61	29	3.0	2.0	1.5
31			61		3.5	2.0	
Mean		0.4	55.0	56.2	10.8	2.9	1.6
Runoff in acre-feet		1.6	3380	3340	666	180	96

* Beginning of Record

MIDDLE FORK FEATHER RIVER WMSA

TABLE 17
DAILY MEAN DISCHARGE
MIDDLE FORK FEATHER RIVER NEAR PORTOLA
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11			NO RECORD AVAILABLE				
12							
13			FOR 1968 SEASON				
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Mean							
Runoff in acre-feet							


Creek
TO PORTOLA
Mid.
Fk.
Beckwourth
70
Vinton
TO RENO
WESTERN
PACIFIC
Feather
River
Last Chance
Lake
Last
Chance
49
DICEN
LANE
Morris
Slough
Dicen Slough
Canal
Group
Group
LANE
PLUMAS CO.
SIERRA CO.
HARRIET
West Side
Feather River
89
Calpine
Fletcher Cr.
Spring Channel
49
Turner Cr.
Turner Canyon
Sattley
Spring Brook Cr.
Miller
Middle Fork
Sierraville
Hamlin Creek
Webber Creek
Gold Stream
Little Truckee Div.
89
TO TRUCKEE
Loyalton
Smithneck Creek
Valley Cr.
Bear
SCHEMATIC DIAGRAM
OF MIDDLE FORK FEATHER RIVER
WATERMASTER SERVICE AREA

North Fork Cottonwood Creek Watermaster Service Area

The North Fork Cottonwood Creek service area is located in the southwestern part of Shasta County near the towns of Ono and Gas Point. There are 13 water right owners in the area with total allotments of 30.30 cubic feet per second.

North Fork Cottonwood Creek and its tributaries, Moon Creek and Jerusalem Creek, are the major sources of water supply in the area. These creeks rise on the east slopes of the foothills of the Coast Range Mountains. North Fork Cottonwood Creek flows in a southeasterly direction to its confluence with Cottonwood Creek near Gas Point. The area is characterized by high summer temperatures and moderate rainfall. The irrigable land consists of sparsely scattered parcels separated by steep, brushy hills. These lands are at about the 1,000-foot elevation.

A schematic drawing of the North Fork Cottonwood Creek stream system is presented as Figure 11, page 55.

Water Supply

Snowmelt contributes to the flow in North Fork Cottonwood Creek during the early weeks of the irrigation season. However, perennial springs provide the major source of supply during the summer and fall months. The flow is normally sufficient to supply all demands. In dry years, however, the available supply may be as low as 30 to 40 percent of the decreed allotments.

A record of the daily mean discharge of North Fork Cottonwood Creek near Igo is presented in Table 18. This stream gaging station is located downstream from most points of diversion on the creek, but gives a general indication of the water supply.

Method of Distribution

The general practice throughout the area is to irrigate by wild flooding.

NORTH FORK COTTONWOOD CREEK WMSA

TABLE 18
DAILY MEAN DISCHARGE
NORTH FORK COTTONWOOD CREEK NEAR IGO
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	294	151	56	27	5.1	2.5	3.0
2	272	132	50	26	5.1	2.5	2.8
3	262	119	46	26	5.4	2.0	2.8
4	245	115	46	26	4.5	1.8	2.5
5	240	111	46	26	3.9	1.8	2.2
6	196	107	46	27	3.9	1.8	2.5
7	191	104	32	27	3.6	1.5	2.5
8	181	104	39	26	3.9	1.6	2.5
9	175	104	36	26	3.9	1.8	2.5
10	170	100	39	25	4.2	1.5	3.0
11	161	96	37	25	4.2	1.5	3.3
12	191	96	37	25	4.2	1.2	2.2
13	312	92	46	22	3.6	1.2	2.2
14	245	88	46	21	2.2	1.5	2.8
15	212	88	41	20	2.2	2.2	3.3
16	262	88	36	18	2.5	2.0	3.6
17	228	84	34	17	3.0	2.0	3.6
18	212	81	36	16	2.8	2.0	3.3
19	202	78	39	13	1.3	4.8	3.0
20	196	76	64	13	1.3	11	2.8
21	186	73	45	13	1.2	13	3.0
22	181	73	43	13	1.0	8.8	3.0
23	170	76	39	13	0.8	6.2	3.0
24	170	73	37	11	0.8	4.2	3.0
25	170	70	37	7.6	0.8	4.2	1.5
26	165	67	37	6.6	1.2	6.9	1.3
27	156	64	36	6.6	1.2	6.2	1.3
28	132	64	33	6.6	1.0	6.2	1.3
29	123	62	32	6.6	1.0	4.2	1.3
30	119	62	29	6.2	1.2	3.6	1.3
31	123		29		1.5	3.3	
Mean	198	90	40	18	2.7	3.7	2.6
Runoff in acre-feet	12180	5350	2480	1080	164	228	154

One water user, however, pumps directly from the creek using a sprinkler system to irrigate his crops. Pumping was necessary at this diversion point because the irrigated land was higher in elevation than the creek channel.

The North Fork Cottonwood Creek decree (see Table 1) provides for distribution of water on an equal and correlative basis for all users - one priority class.

1968 Distribution

Watermaster service began July 1 in the North Fork Cottonwood Creek service area and continued until September 30. Ross P. Rogers, Water Resources Engineering Associate, was watermaster during this period.

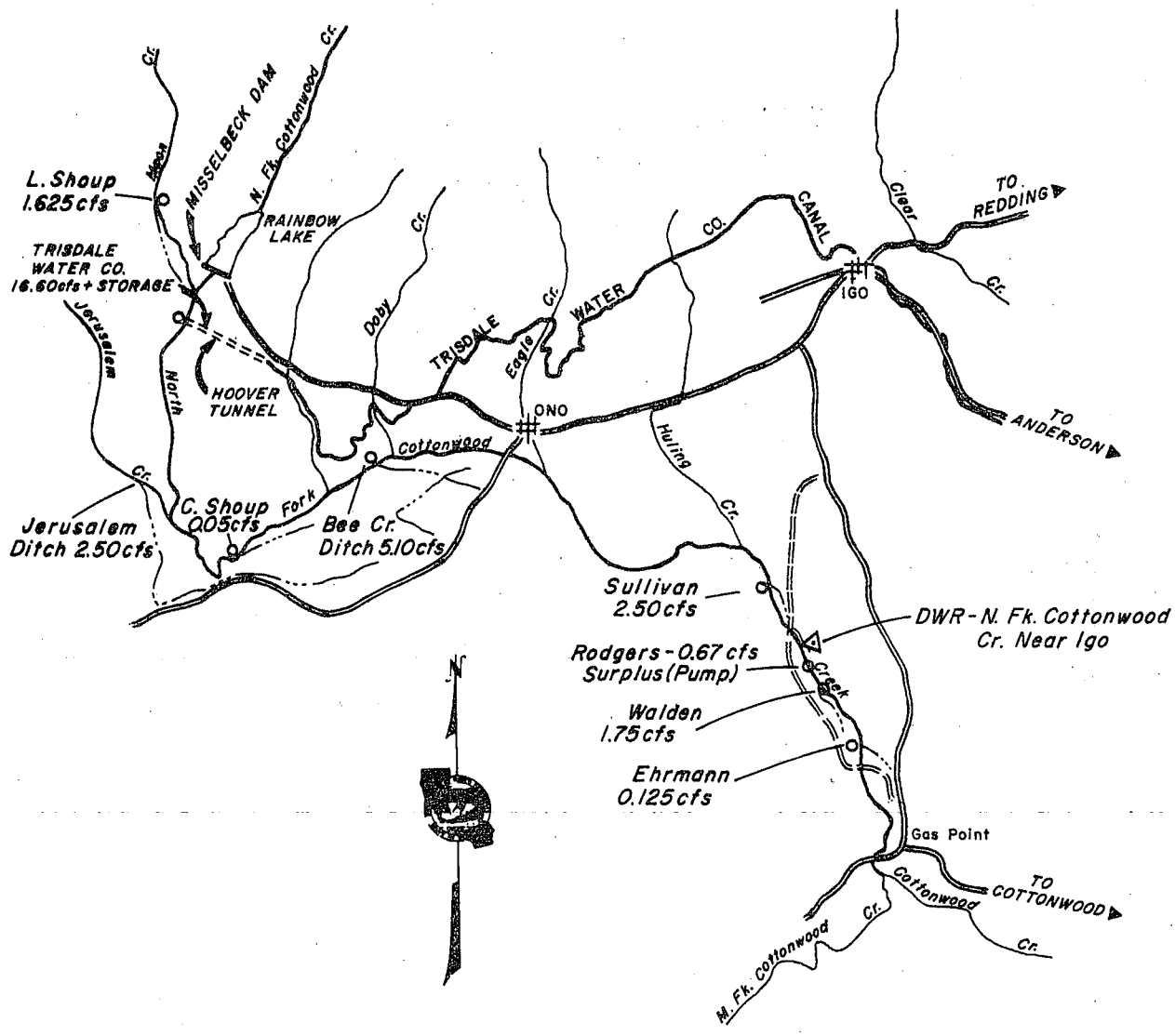
The available water supply in North Fork Cottonwood Creek was extremely poor. All water right owners suffered from one of the driest years in recent history. The stream gaging station near Igo recorded a total of 9,460 acre-feet of runoff between April 1 and September 30. This is about 30 percent of the mean for a 12-year period of record. The July 1 to September 30 runoff at the same station was only 546 acre-feet, or about 20 percent of the mean for that period.

The lowest water right owners on the stream system were almost completely out of water at times because of excessive evaporation and conveyance losses. Considerable adjustment and regulation was required to insure an equitable distribution of the available water supply.

A widespread rainstorm occurring in the third week of August contributed immensely toward easing the drought. The streamflow receded quickly in late August and early September. During the remainder of September, although the supply was still deficient, most users were able to prevent complete loss of pasture growth.

Special Occurrences

Missellbeck Dam remained in the unsafe category as determined by the Department's Division of Dam Safety. An order restricting storage behind the dam in Rainbow Lake was again issued. Some minor work was accomplished by the owner; however, until extensive repairs are made, curtailment of the reservoir storage will continue.



△ Permanent Recorder Station

SCHEMATIC DIAGRAM
OF N. FK. COTTONWOOD CR.
WATERMASTER SERVICE AREA

North Fork Pit River Watermaster Service Area

The North Fork Pit River service area lies along the west slopes of the Warner Mountains in northeastern Modoc County and extends from the Oregon border about 45 miles southward to a point just south of Alturas. There are 92 water right owners in the area with total allotments of 214.655 cubic feet per second.

A number of small independent stream systems, rising on the west slope of the Warner Mountains and generally following a westerly direction, comprise the major source of water supply. Three of these streams, New Pine Creek, Cottonwood Creek, and Davis Creek, are tributary to Goose Lake. All other streams in the service area are tributary to the North Fork Pit River. They are: Linville Creek, Franklin Creek, Joseph Creek, Thoms Creek, and Parker Creek. The North Fork Pit River flows in a southerly direction from the south rim of Goose Lake to its confluence with the South Fork Pit River immediately below Alturas. Streams tributary to Goose Lake do not contribute directly to the flow of the North Fork Pit River, since the lake has not spilled into the river for nearly 100 years.

The place of use in the northern half of the area lies in a relatively long, narrow, sloping strip extending between the eastern shore of Goose Lake and the foothills of the Warner Mountains. The places of use in the southern half of the area, which are supplied from the North Fork Pit River and its tributaries, are primarily in the narrow valleys bordering the streams.

A schematic drawing of each major stream system within the North Fork Pit River service area is presented as Figures 12 through 12k, pages 62 through 73.

Water Supply

The streams which serve the area are fed by snowmelt runoff and springs in the Warner Mountains. A large portion of the runoff occurs early in the spring, decreasing rapidly in May and June. The watershed of New Pine Creek, however, is at a higher elevation and maintains a good supply well into the summer. After the snowpack is depleted, perennial springs at the headwaters of the tributaries are the main sources of water supply. Linville Creek, with its small drainage basin, depends almost entirely on springs at its head. Gleason Creek, Thoms Creek, and Cottonwood Creek are usually dry in August, except during years of above-average water supply.

Some supplemental water is stored in small reservoirs throughout the area, none of which are operated by the watermaster. However, the inflows to some of these reservoirs are under the watermaster's jurisdiction.

Records of daily mean discharge at several stream gaging stations in the North Fork Pit River service area are presented in Tables 19 through 29, pages 59 through 61.

Methods of Distribution

Irrigation is accomplished primarily by wild flooding from field ditches located along high spots in the meadows. Various types of diversion structures are used to divert the natural streamflow into small earth ditches which convey it to the meadows. At present there is a limited amount of sprinkler irrigation, some by naturally developed pressure and some by direct pumping from small sumps in the ditches. Subirrigation by the use of large flashboard dams to raise the water level in the stream channel is being practiced on the North Fork Pit River between Parker Creek and Alturas.

The several decrees (see Table 1) which apply to the North Fork Pit River service area establish the following number of priority classes for the various stream systems: New Pine Creek - four; Cottonwood Creek - six; Davis Creek - four; Linville Creek - two; Franklin Creek - four; Joseph Creek - four; Thoms Creek - three; Parker Creek - four; Shields Creek - four; Gleason Creek - five; and North Fork Pit River - five.

1968 Distribution

Watermaster service began April 1 in the North Fork Pit River service area and continued until September 30. Charles H. Holmes, Assistant Civil Engineer, was watermaster during this period.

The available water supply for 1968 was far below average throughout the service area. Because of a heavy rainstorm in August, however, streamflows during the latter part of the season were at or near average conditions.

New Pine Creek. At the beginning of the season the available streamflow was able to meet only 30 percent of full entitlements. However, between May 10 and June 9 the flow had increased sufficiently to supply all decreed water rights. After June 9 the flow gradually decreased until only 30 percent of full priority allotments were being met on June 30.

Commencing July 1, in accordance with the decree, distribution was based on the priority system (four priorities). At this time 17 percent of third priority allotments was available. The flow then gradually continued to diminish until by the end of the season only 30 percent of second priority rights were being met.

Cottonwood Creek. The available water supply in Cottonwood Creek in mid-June was serving only 70 percent of first priority allotments (six priorities). At the end of the season the supply was virtually exhausted, as only 10 percent of first priority allotments were being filled.

Davis Creek. The available water supply in Davis Creek was sufficient to serve about 80 percent of third priority allotments (four priorities) on April 27. The flow increased gradually to its peak for the season on May 20 when 25 percent of fourth priorities was being satisfied. It then gradually receded, reaching 100 percent of second priorities on July 14 and 75 percent at the end of the season.

Linville Creek. The available water supply in Linville Creek remained quite consistent throughout the irrigation season, but was never enough to supply any second priority allotments (two priorities). The flow during the latter part of April was 66 percent of first priority allotments. It then gradually increased to 74 percent on June 6 and stayed essentially constant until the end of the watermaster season.

Franklin Creek. The available water supply in Franklin Creek on April 24 was 20 percent of third priority allotments (four priorities). It then increased slightly to 34 percent of third priority allotments on May 5. The supply then decreased slowly until by the middle of July only second priority allotments were available. From then until the end of the watermaster season the flow remained fairly constant. On September 15 the winter schedule of priorities went into effect. Under this schedule 50 percent of second priority allotments was served.

Joseph Creek. The available water in Joseph Creek was increased from 50 percent of second priority on April 24 to 100 percent in mid-May. The flow then receded rapidly until mid-July when only 35 percent of first priority allotments (four priorities) was available. It then remained constant for the remainder of the season.

Thoms Creek. A sufficient water supply existed in Thoms Creek to meet all allotments (three priorities) until May 25. The flow then receded to 50 percent of first priority allotments between mid-August and early September. It then gradually increased until the end of the watermaster season when all allotments were fully met.

North Fork Pit River. The flow in North Fork Pit River was able to supply only about 90 percent of second priority allotments (five priorities) on May 1. It then decreased steadily throughout the remainder of the season. On September 30 only 10 percent of first priority allotments was being met.

NORTH FORK PIT RIVER WMSA

TABLE 19
DAILY MEAN DISCHARGE
NEW PINE CREEK BELOW SCHROEDER'S
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1			11	28	7.5	5.2	4.8
2			13	32	7.5	5.2	4.6
3			15	29	7.1	5.0	4.5
4			21	28	7.1	4.9	4.5
5			25	32	6.8	4.8	4.4
6			20	29	6.5	4.8	4.4
7			15	28	6.5	4.7	4.4
8			15	24	6.2	4.7	4.3
9			17	21	6.0	4.7	4.3
10			24	20	6.0	4.7	4.3
11			25	19	5.9	4.7	4.3
12			25	18	5.8	4.7	4.3
13			28	15	5.8	4.7	4.2
14			24	14	5.7	4.7	4.2
15			20	13	5.7	4.7	4.2
16			20	13	5.6	4.9	4.2
17			20	13	5.5	4.8	4.2
18			21	11	5.8	5.2	4.2
19			25	11	5.9	7.5	4.2
20			29	11	5.8	6.2	4.2
21			32	11	5.7	5.7	4.2
22			29	10	5.7	5.7	4.2
23			28	10	5.6	5.6	4.1
24			26	9.6	5.5	5.5	4.1
25			24	8.3	5.5	5.4	4.0
26		6.8*	21	8.0	5.4	5.4	4.0
27		7.1	24	8.0	5.3	5.4	4.0
28		7.8	25	8.0	5.2	5.2	4.0
29		8.0	29	8.0	5.2	5.2	4.0
30		9.6	29	7.8	5.0	5.1	4.0
31			28		4.9	4.8	
Mean		7.9	22.3	16.6	5.9	5.2	4.2
Runoff in acre-feet		78	1370	985	364	316	252

* Beginning of Record

NORTH FORK PIT RIVER WMSA

TABLE 20
DAILY MEAN DISCHARGE
COTTONWOOD CREEK BELOW LARKIN GARDEN DITCH
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1				5.1	0.5	0.2	0.4
2				5.2	0.5	0.2	0.4
3				5.1	0.5	0.2	0.4
4				5.6	0.4	0.2	0.4
5				6.3	0.4	0.2	0.4
6				7.0	0.4	0.2	0.4
7				6.3	0.4	0.2	0.4
8				5.2	0.4	0.2	0.4
9				4.3	0.4	0.2	0.4
10			4.2*	4.0	0.4	0.2	0.3
11			4.2	3.7	0.4	0.2	0.3
12			4.3	3.4	0.4	1.1	0.3
13			4.6	3.0	0.4	2.3	0.3
14			4.3	2.8	0.4	3.4	0.3
15			4.4	2.5	0.3	3.8	0.3
16			4.3	2.2	0.3	3.8	0.3
17			4.2	2.1	0.3	3.9	0.3
18			4.2	2.0	0.3	6.8	0.3
19			4.8	1.8	0.3	3.4	0.3
20			5.2	1.7	0.3	1.7	0.3
21			5.9	1.5	0.3	0.5	0.3
22			5.8	1.4	0.3	0.5	0.3
23			5.6	1.3	0.3	0.5	0.3
24			4.9	1.1	0.3	0.5	0.3
25			4.3	1.1	0.2	0.5	0.3
26			4.3	0.8	0.2	0.4	0.3
27			4.3	0.8	0.2	0.4	0.3
28			4.6	0.8	0.2	0.4	0.3
29			5.1	0.7	0.2	0.4	0.3
30			5.5	0.7	0.2	0.4	0.3
31			5.5		0.2	0.4	
Mean			5.2	2.9	0.3	1.2	0.3
Runoff in acre-feet			227	176	20	75	20

* Beginning of Record

NORTH FORK PIT RIVER WMSA

TABLE 21
DAILY MEAN DISCHARGE
DAVIS CREEK AT OLD FISH WHEEL
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1			18	26	6.6	4.2	4.0
2			20	28	6.9	4.4	4.0
3			23	31	6.6	4.2	4.0
4			26	28	5.7	4.1	4.1
5			27	31	5.7	4.0	4.0
6			26	32	5.6	4.0	3.8
7			25	29	5.6	4.0	3.8
8			27	26	5.5	4.0	3.8
9			27	24	4.7	3.9	3.8
10			28	22	4.7	3.8	3.8
11			27	19	4.7	3.8	3.8
12			27	19	5.0	3.5	3.8
13			25	19	5.0	3.4	3.8
14			20	18	5.0	3.4	3.8
15			22	15	4.7	4.1	3.8
16			24	14	4.5	5.1	3.8
17			24	14	4.5	4.2	3.8
18			27	14	4.4	4.4	3.8
19			29	14	4.4	14	3.8
20			35	14	4.4	4.7	3.8
21			34	14	4.4	4.1	3.8
22			34	13	4.2	4.1	3.8
23			34	12	4.2	4.0	3.8
24		4.0*	34	10	4.2	4.0	3.8
25		4.0	31	8.0	4.1	3.9	3.8
26		4.2	31	7.7	4.0	3.9	3.8
27		4.7	29	7.7	4.0	3.9	3.8
28		5.7	31	7.7	4.0	3.9	3.8
29		9.5	32	7.3	4.0	3.9	3.8
30		14	29	7.3	4.0	4.0	3.8
31			27		4.1	4.0	
Mean		6.6	27.4	169	4.8	4.4	3.8
Runoff in acre-feet		91	1680	1002	296	267	228

* Beginning of Record

TABLE 22
DAILY MEAN DISCHARGE

LINVILLE CREEK AT OLD POWER HOUSE

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1			2.5*	2.6	2.6	2.6	2.6
2			2.5	2.7	2.6	2.6	2.6
3			2.6	2.7	2.6	2.6	2.6
4			2.6	2.7	2.6	2.6	2.6
5			2.6	2.8	2.6	2.6	2.6
6			2.6	2.8	2.5	2.6	2.6
7			2.6	2.8	2.5	2.6	2.6
8			2.6	2.7	2.5	2.6	2.6
9			2.6	2.7	2.5	2.6	2.6
10			2.6	2.7	2.5	2.6	2.6
11			2.6	2.7	2.5	2.6	2.6
12			2.6	2.7	2.5	2.6	2.6
13			2.6	2.7	2.6	2.6	2.6
14			2.6	2.7	2.6	2.6	2.6
15			2.6	2.7	2.6	2.6	2.6
16			2.6	2.7	2.6	2.6	2.6
17			2.6	2.7	2.6	2.6	2.6
18			2.6	2.7	2.6	2.6	2.6
19			2.6	2.6	2.6	2.7	2.6
20			2.6	2.6	2.6	2.7	2.6
21			2.6	2.6	2.6	2.6	2.6
22			2.7	2.6	2.6	2.6	2.6
23			2.7	2.6	2.6	2.6	2.6
24			2.7	2.6	2.6	2.6	2.6
25			2.6	2.6	2.6	2.6	2.6
26			2.6	2.6	2.6	2.6	2.6
27			2.6	2.6	2.6	2.6	2.6
28			2.6	2.6	2.6	2.6	2.6
29			2.6	2.6	2.6	2.6	2.6
30			2.6	2.6	2.6	2.6	2.6
31			2.6		2.6	2.6	
Mean			2.6	2.7	2.6	2.6	2.6
Runoff in acre-feet			160	158	158	160	154

* Beginning of Record

TABLE 23
DAILY MEAN DISCHARGE

FRANKLIN CREEK ABOVE DIVERSIONS

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1			4.5	2.7	1.9	1.5	1.4
2			4.5	2.9	1.7	1.5	1.4
3			4.5	2.9	1.7	1.5	1.3
4			4.4	2.7	1.7	1.5	1.3
5			4.2	3.2	1.7	1.4	1.3
6			4.2	2.7	1.6	1.4	1.2
7			3.9	2.6	1.6	1.5	1.2
8			3.7	2.5	1.6	1.5	1.2
9			3.6	2.4	1.6	1.5	1.2
10			3.6	2.2	1.6	1.5	1.1
11			3.6	2.1	1.6	1.4	1.3
12			3.6	2.1	1.6	1.4	1.5
13			3.7	2.2	1.6	1.4	1.6
14			3.7	2.1	1.5	1.5	1.6
15			3.7	2.0	1.4	1.5	1.6
16			3.6	2.0	1.4	1.7	1.6
17			3.5	2.0	1.4	1.6	1.6
18			3.4	2.0	1.5	1.6	1.6
19			3.6	2.0	1.4	2.7	1.6
20			3.6	2.0	1.4	2.0	1.6
21			3.6	2.0	1.4	1.9	1.6
22			3.7	1.9	1.3	1.9	1.6
23			3.7	1.9	1.3	1.6	1.6
24		3.0*	3.6	1.9	1.3	1.6	1.6
25		2.9	3.5	1.9	1.4	1.6	1.6
26		3.0	3.5	1.9	1.4	1.6	1.6
27		3.2	3.4	1.9	1.4	1.6	1.6
28		3.4	3.4	1.9	1.3	1.6	1.6
29		3.6	3.4	1.9	1.2	1.5	1.6
30		4.1	3.2	1.9	1.2	1.5	1.6
31			2.9		1.4	1.5	
Mean		3.3	3.7	2.2	1.5	1.6	1.5
Runoff in acre-feet		46	228	132	91	98	92

* Beginning of Record

TABLE 24
DAILY MEAN DISCHARGE

JOSEPH CREEK BELOW COUCH CREEK

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1			4.5	4.5	1.6	0.9	0.9
2			4.8	4.4	1.5	0.9	0.9
3			4.9	4.5	1.2	0.9	0.9
4			5.1	4.0	1.2	0.9	0.9
5			5.1	5.4	1.2	0.9	0.9
6			4.5	5.5	1.2	0.8	0.9
7			3.5	3.7	1.1	0.8	0.9
8			3.5	3.2	1.2	0.8	0.9
9			3.5	2.8	1.1	0.8	0.9
10			3.7	2.3	1.0	0.7	0.9
11			3.7	2.1	1.0	0.7	0.8
12			3.7	2.1	1.0	0.7	0.8
13			5.6	2.1	1.0	0.7	0.9
14			6.2	2.0	1.0	0.7	0.9
15			5.0	1.9	1.0	0.8	0.9
16			4.5	1.7	1.0	1.2	0.9
17			3.7	1.6	1.0	1.0	0.9
18			3.7	1.5	0.9	1.4	0.9
19			4.6	1.6	0.9	1.3	0.9
20			5.0	1.8	0.9	1.3	1.0
21			4.9	1.9	0.9	2.8	1.0
22			6.3	1.8	0.9	2.8	1.0
23			7.0	1.7	0.9	1.7	1.0
24		4.4*	6.2	1.4	0.9	1.5	0.9
25		3.7	5.8	1.3	0.9	1.2	0.9
26		3.5	5.6	1.1	1.0	1.2	0.9
27		3.3	5.0	1.2	1.0	1.1	0.9
28		3.5	5.4	1.6	1.0	1.1	0.9
29		3.7	6.2	1.7	1.0	1.0	0.9
30		4.0	6.0	1.7	1.0	1.0	0.9
31			5.1		0.9	0.9	
Mean		3.7	4.9	2.5	1.0	1.2	0.9
Runoff in acre-feet		52	302	147	64	76	54

* Beginning of Record

TABLE 25
DAILY MEAN DISCHARGE

NORTH FORK PIT RIVER BELOW THOMS CREEK

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1				17	2.1	8.5	3.8
2				14	1.9	8.0	3.8
3			21*	17	2.0	6.9	2.8
4			23	16	2.0	6.9	2.8
5			24	29	2.0	6.5	3.7
6			25	49	2.0	6.5	3.8
7			21	42	1.9	6.5	3.8
8			17	29	1.8	6.2	3.8
9			16	21	1.7	6.0	3.8
10			15	16	1.8	4.3	3.8
11			16	14	1.9	5.5	3.7
12			18	13	1.9	4.3	2.8
13			50	11	1.9	4.3	2.8
14			51	10	2.0	4.3	2.8
15			43	9.5	1.8	5.5	2.9
16			34	6.0	1.9	8.0	2.1
17			24	4.3	2.0	5.5	0.7
18			21	3.8	2.6	4.3	1.0
19			21	3.7	6.5	17	1.1
20			25	3.0	6.5	17	0.8
21			28	2.9	6.2	11	0.6
22			38	2.8	6.2	15	0.7
23			59	2.8	6.5	11	0.7
24			60	2.7	6.2	9.5	0.7
25			47	2.3	8.5	5.5	0.7
26			35	2.2	8.5	5.6	0.7
27			26	2.1	8.5	4.3	0.7
28			23	2.1	8.5	4.0	0.7
29			21	2.2	8.5	3.9	0.7
30			21	2.3	8.5	3.8	0.7
31			18		8.0	3.9	
Mean			29.0	11.8	4.3	7.1	2.2
Runoff in acre-feet			1660	698	262	435	126

* Beginning of Record

TABLE 26
DAILY MEAN DISCHARGE

THOMS CREEK AT CEDARVILLE-ALTURAS HIGHWAY

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1			9.0	4.5	2.0	0.2	1.4
2			9.7	4.5	1.9	0.7	1.3
3			10	4.8	1.5	0.3	1.3
4			11	4.5	1.4	0.1	0.9
5			11	5.8	1.4	0.0	0.8
6			9.0	6.4	1.4	0.0	0.7
7			7.1	5.5	1.3	0.0	0.6
8			6.8	5.2	1.1	0.0	0.6
9			6.8	5.0	1.1	0.0	0.6
10			6.8	4.9	1.0	0.0	0.6
11			6.9	4.5	0.9	0.0	0.6
12			7.0	4.4	0.9	0.0	0.7
13			11	4.0	1.0	0.0	0.7
14			9.0	3.9	1.0	0.4	0.7
15			8.1	3.9	1.0	0.4	0.7
16			7.5	3.8	1.3	0.5	0.7
17			6.4	3.9	1.0	0.5	0.7
18			6.0	3.0	0.9	0.5	0.7
19			6.2	3.0	0.8	5.8	0.7
20			6.2	3.0	0.8	2.0	0.8
21			6.0	2.8	0.8	3.1	0.9
22			6.4	2.8	0.7	2.8	0.9
23			7.0	2.7	0.7	2.6	0.8
24		7.5*	6.9	2.6	0.6	2.2	0.8
25		7.4	6.4	2.4	0.6	2.0	0.8
26		7.4	5.8	2.0	0.6	2.0	0.8
27		7.5	5.5	2.0	0.5	2.0	0.8
28		7.5	5.4	2.0	0.0	2.0	0.8
29		7.5	5.3	2.0	0.0	1.9	0.8
30		8.1	5.0	2.0	0.0	1.5	0.8
31			4.8		0.0	1.4	
Mean		7.5	7.3	3.7	0.9	1.2	0.7
Runoff in acre-feet		105	448	221	56	69	48

* Beginning of Record

TABLE 27
DAILY MEAN DISCHARGE

PARKER CREEK AT FOGARTY RANCH

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1				4.7	0.8	0.8	0.2
2				4.7	2.1	0.8	0.2
3				4.7	2.0	0.7	0.2
4				3.6	1.9	0.7	0.2**
5			12.1*	3.6	1.9	1.3	
6			11.6	3.4	1.8	1.3	
7			12.0	3.2	1.8	1.3	
8			10.5	3.2	1.8	1.3	
9			10.5	5.1	1.8	1.0	
10			10.4	3.1	1.8	1.0	
11			10.1	3.0	1.8	0.7	
12			11.2	2.7	1.8	0.7	
13			9.0	2.5	1.8	0.7	
14			9.0	2.5	1.5	0.7	
15			9.1	2.4	1.4	0.7	
16			8.5	1.9	1.4	2.6	
17			8.4	1.9	1.4	5.6	
18			8.7	1.9	1.7	15.8	
19			8.0	1.9	0.9	16.6	
20			8.0	1.6	0.9	8.6	
21			11.0	1.8	0.9	2.0	
22			15.0	1.5	0.9	1.0	
23			14.3	1.5	0.7	0.5	
24			9.2	1.1	0.7	0.5	
25			7.1	1.1	0.7	0.5	
26			6.4	1.1	0.7	0.0	
27			6.1	1.0	0.7	0.0	
28			6.1	0.9	0.6	0.0	
29			5.8	0.9	0.8	0.0	
30			5.4	0.8	0.8	0.3	
31			5.1		0.8	0.4	
Mean			9.2	2.5	1.3	2.2	0.2
Runoff in acre-feet			493	145	80	134	2

* Beginning of Record
** End of Record

TABLE 28
DAILY MEAN DISCHARGE

SHIELDS CREEK BELOW PEPPERDINE RANCH

March through September 1968
(In second-feet)
(Intermittent Measurements Only)

Day	March	April	May	June	July	August	September
1					2.2		
2				2.4		0.6	1.1
3			4.8				
4							
5				1.4		1.1	
6							0.7
7							
8			3.9		0.2		
9					1.5		
10							
11							
12							
13				2.3			
14						0.9	0.6
15							
16							
17			1.4		1.6		
18				2.0		6.7	
19						10.3	
20					1.5	2.3	1.6
21							
22							
23						0.8	
24							
25			2.9	1.0			
26							
27							
28			3.2		1.4	0.9	
29							
30							
31							
Mean							
Runoff in acre-feet							

TABLE 29
DAILY MEAN DISCHARGE

PARKER CREEK ABOVE HIGHWAY 395 NEAR ALTURAS

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1				5.1	2.3	0.7	0.2
2				5.2	2.3	0.7	0.2
3				6.4	2.3	0.7	0.2
4				5.5	2.2	0.3	0.2
5				8.2	2.1	0.3	0.3
6				11.0	2.1	0.3	0.7
7			8.3*	7.4	2.0	0.3	1.9
8			7.5	6.4	1.9	0.3	1.0
9			6.7	5.1	1.9	0.3	1.2
10			6.5	4.4	1.9	0.3	1.9
11			7.4	3.9	1.2	0.3	1.9
12			7.8	3.9	0.9	0.3	1.5
13			12.3	4.7	0.7	0.3	1.5
14			7.5	5.0	0.7	0.3	1.5
15			6.4	4.4	0.7	0.2	1.9
16			5.8	4.4	0.3	0.3	1.5
17			5.1	4.3	1.0	0.7	1.2
18			5.0	3.9	1.2	0.9	0.9
19			5.3	3.9	0.9	2.8	0.9
20			6.4	3.8	0.7	4.4	0.7
21			6.5	3.5	0.7	2.5	0.7
22			7.8	3.3	0.7	2.1	0.7
23			9.2	3.2	0.7	2.0	0.3
24			9.2	3.2	0.3	1.9	0.3
25			7.8	3.1	0.3	0.7	0.3
26			6.8	2.9	0.3	0.7	0.3
27			7.1	2.6	0.7	0.3	0.3
28			6.7	2.5	0.7	0.3	0.3
29			6.4	2.4	0.7	0.2	0.3
30			5.9	2.4	0.7	0.2	0.3
31			5.1		0.7	0.2	
Mean			7.1	4.5	1.6	0.8	0.8
Runoff in acre-feet			350	269	71	50	50

* Beginning of Record

FIGURE 12

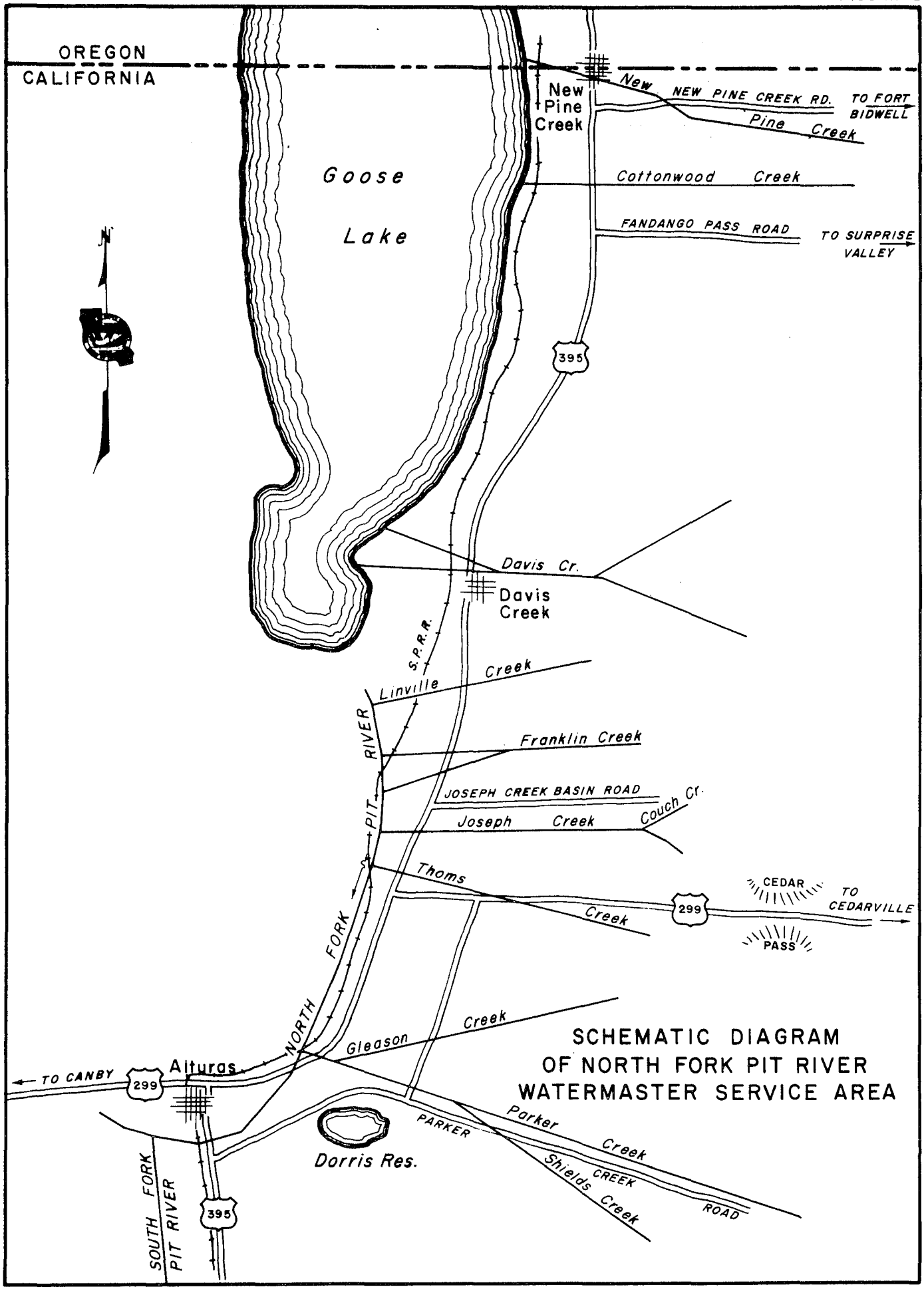
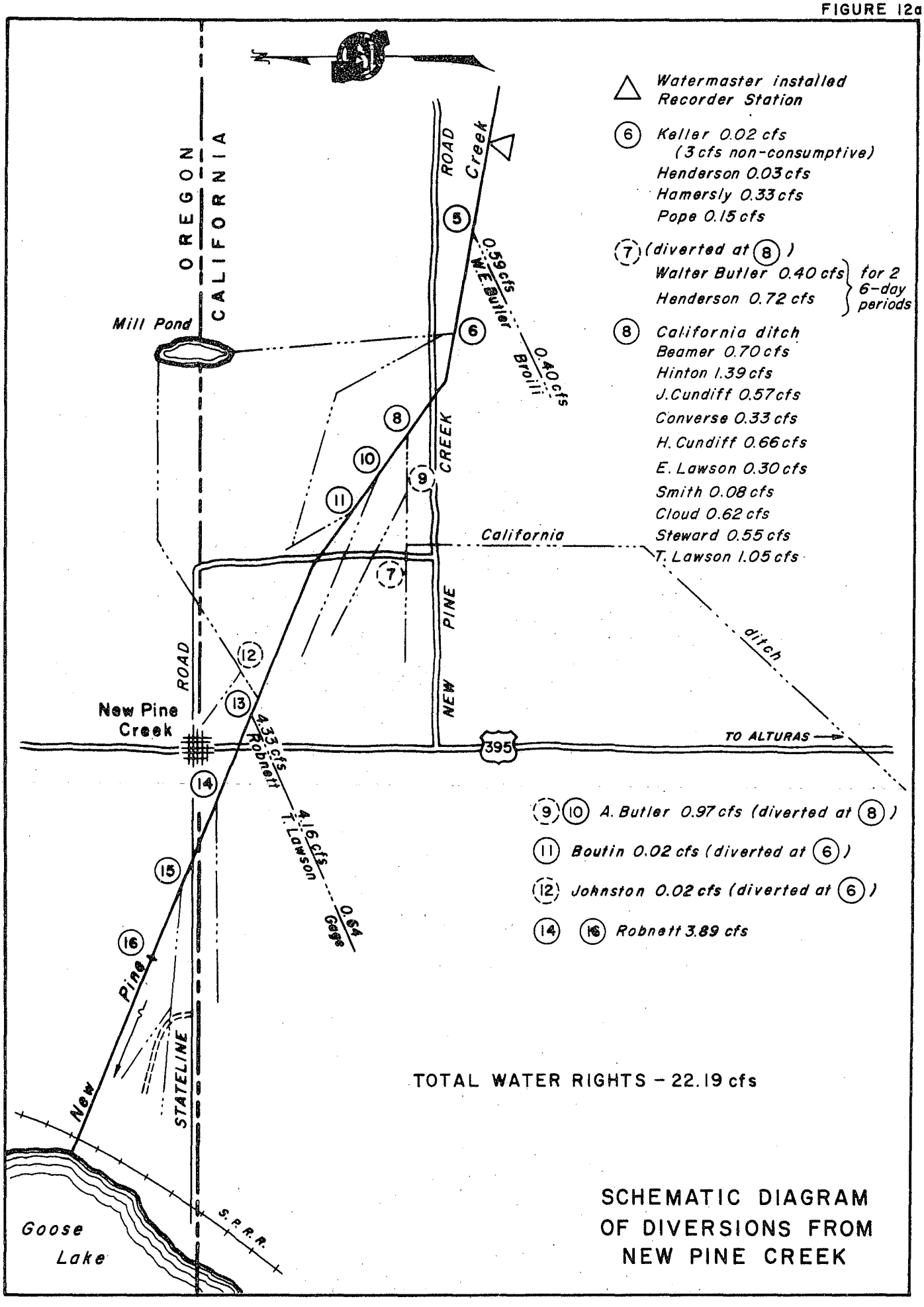
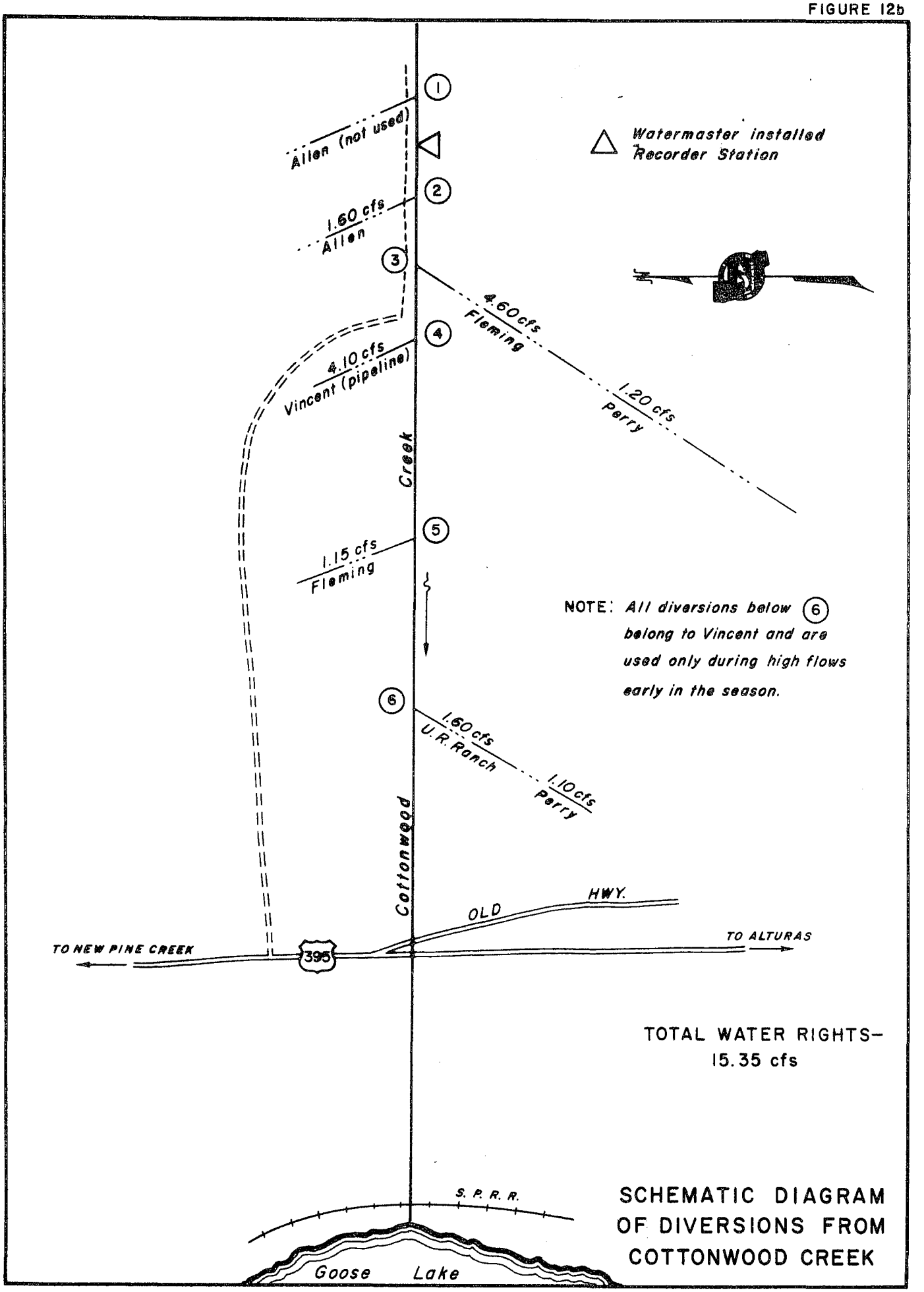

OREGON
CALIFORNIA
New Pine Creek
New
NEW PINE CREEK RD.
TO FORT BIDWELL
Pine Creek
Goose Lake
Cottonwood Creek
FANDANGO PASS ROAD
TO SURPRISE VALLEY
N
395
Davis Cr.
Davis Creek
S.P.R.R.
Linville Creek
RIVER
Franklin Creek
JOSEPH CREEK BASIN ROAD
PIT
Joseph Creek
Couch Cr.
Thoms Creek
CEDAR PASS
TO CEDARVILLE
299
FORK
NORTH
Gleason Creek
SCHEMATIC DIAGRAM
OF NORTH FORK PIT RIVER
WATERMASTER SERVICE AREA
TO CANBY
299
Alturas
PARKER
Parker Creek
Dorris Res.
Shields Creek
CREEK ROAD
SOUTH FORK
PIT RIVER
395

FIGURE 12a



SCHEMATIC DIAGRAM OF DIVERSIONS FROM NEW PINE CREEK

FIGURE 12b



SCHEMATIC DIAGRAM OF DIVERSIONS FROM COTTONWOOD CREEK

FIGURE 12c

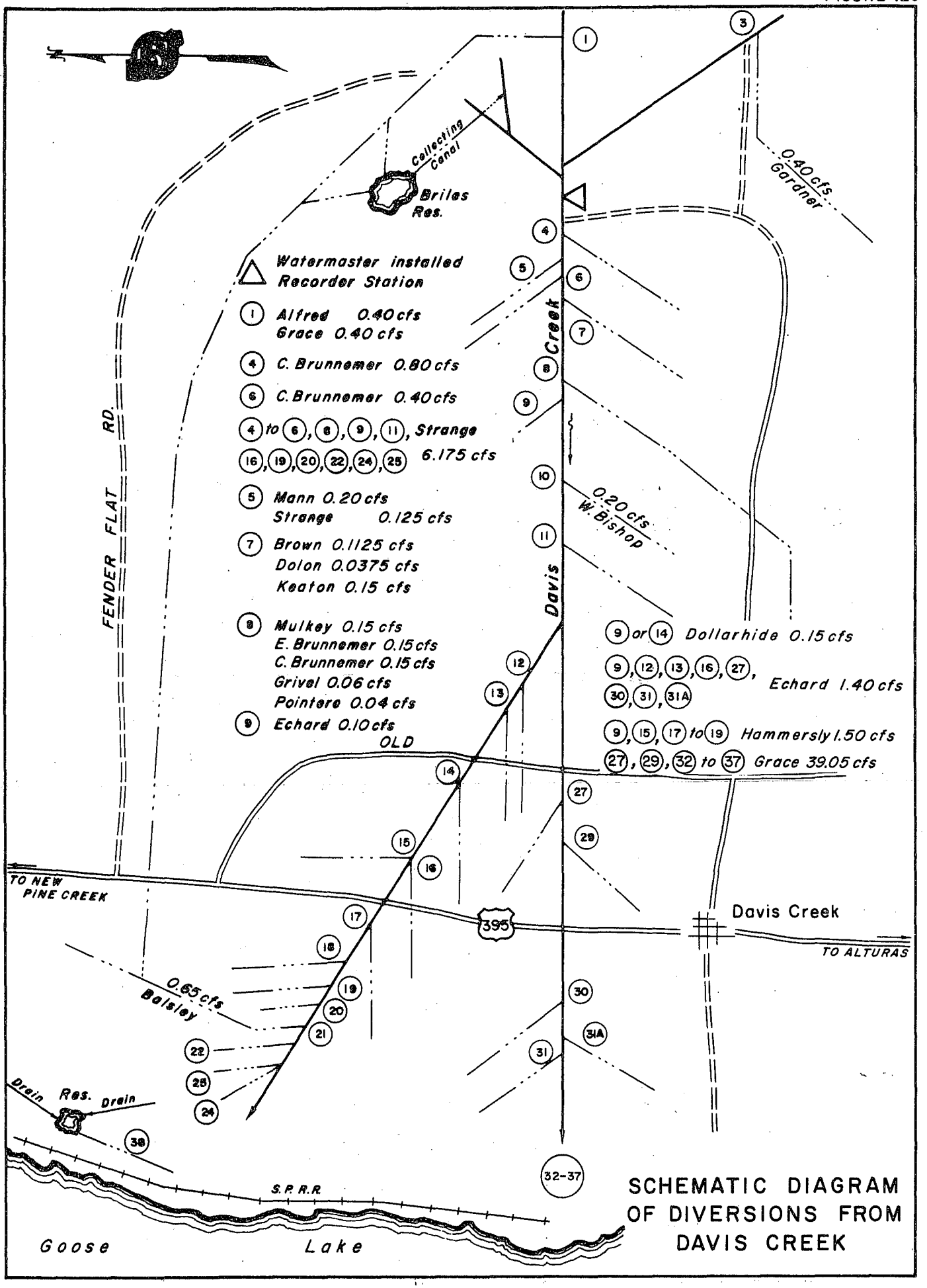
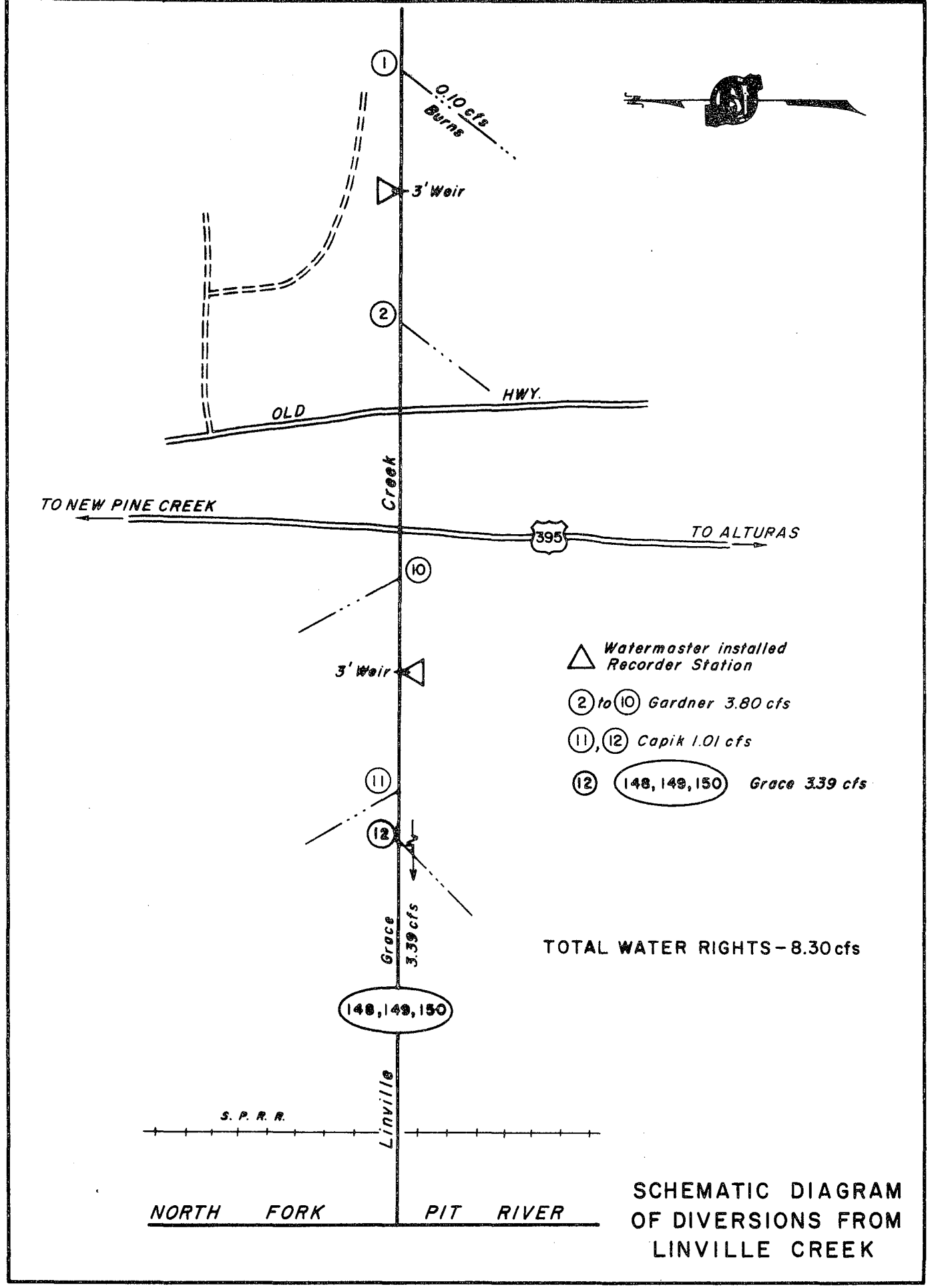
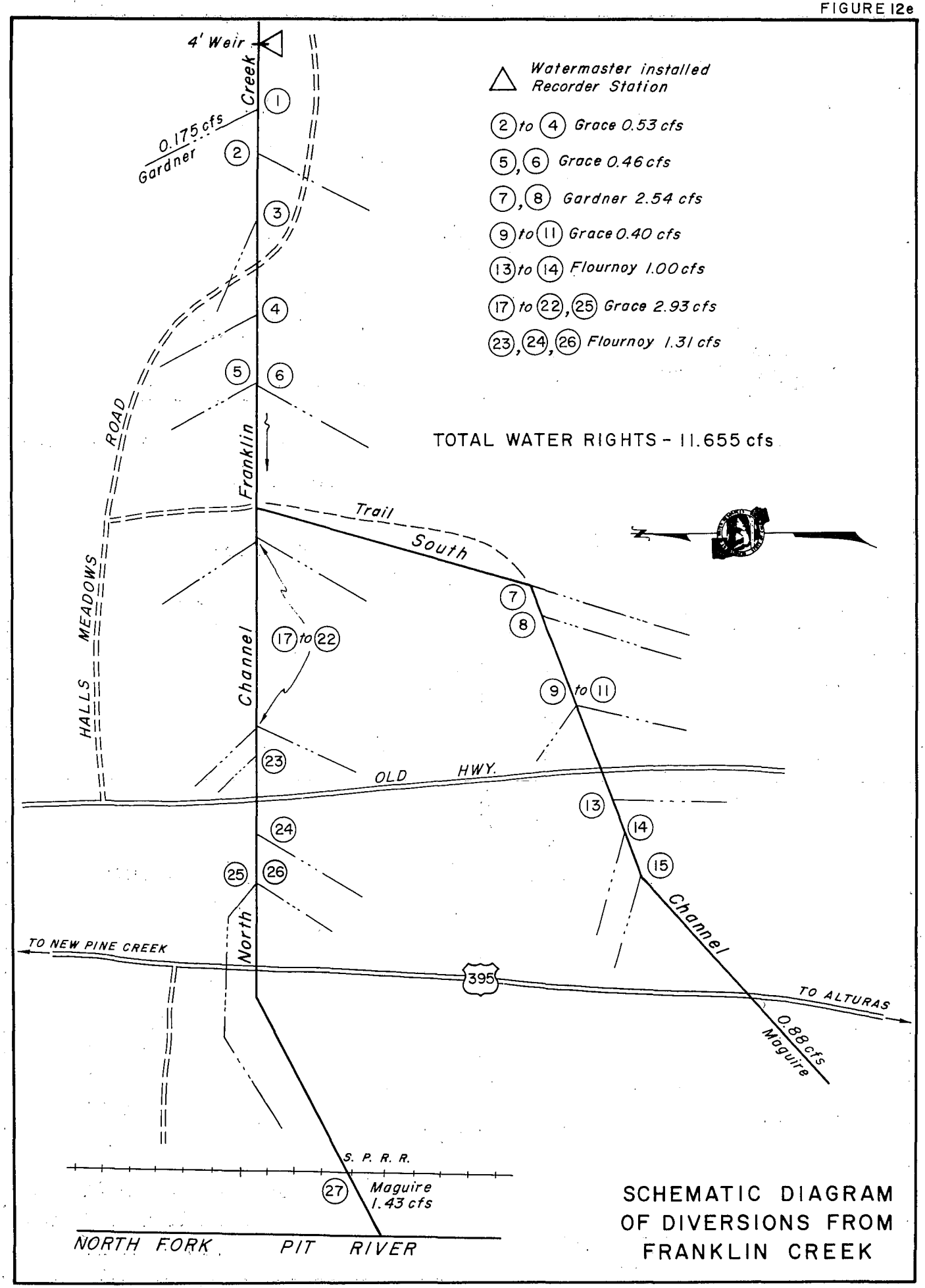

Collecting Canal
Briles Res.
0.40 cfs Gardner
Watermaster installed Recorder Station
1 Alfred 0.40 cfs
Grace 0.40 cfs
4 C. Brunnemer 0.80 cfs
6 C. Brunnemer 0.40 cfs
4 to 6, 8, 9, 11, Strange
16, 19, 20, 22, 24, 25 6.175 cfs
5 Mann 0.20 cfs
Strange 0.125 cfs
7 Brown 0.1125 cfs
Dolon 0.0375 cfs
Keaton 0.15 cfs
8 Mulkey 0.15 cfs
E. Brunnemer 0.15 cfs
C. Brunnemer 0.15 cfs
Grivel 0.06 cfs
Pointere 0.04 cfs
9 Echard 0.10 cfs
FENDER FLAT RD.
Davis Creek
0.20 cfs W. Bishop
9 or 14 Dollarhide 0.15 cfs
9, 12, 13, 16, 27, 30, 31, 31A Echard 1.40 cfs
9, 15, 17 to 19 Hammersly 1.50 cfs
27, 29, 32 to 37 Grace 39.05 cfs
OLD
TO NEW PINE CREEK
395
Davis Creek
TO ALTURAS
0.65 cfs Baisley
Drain
Res. drain
S.P.R.R.
Goose Lake
32-37
SCHEMATIC DIAGRAM OF DIVERSIONS FROM DAVIS CREEK

FIGURE 12d



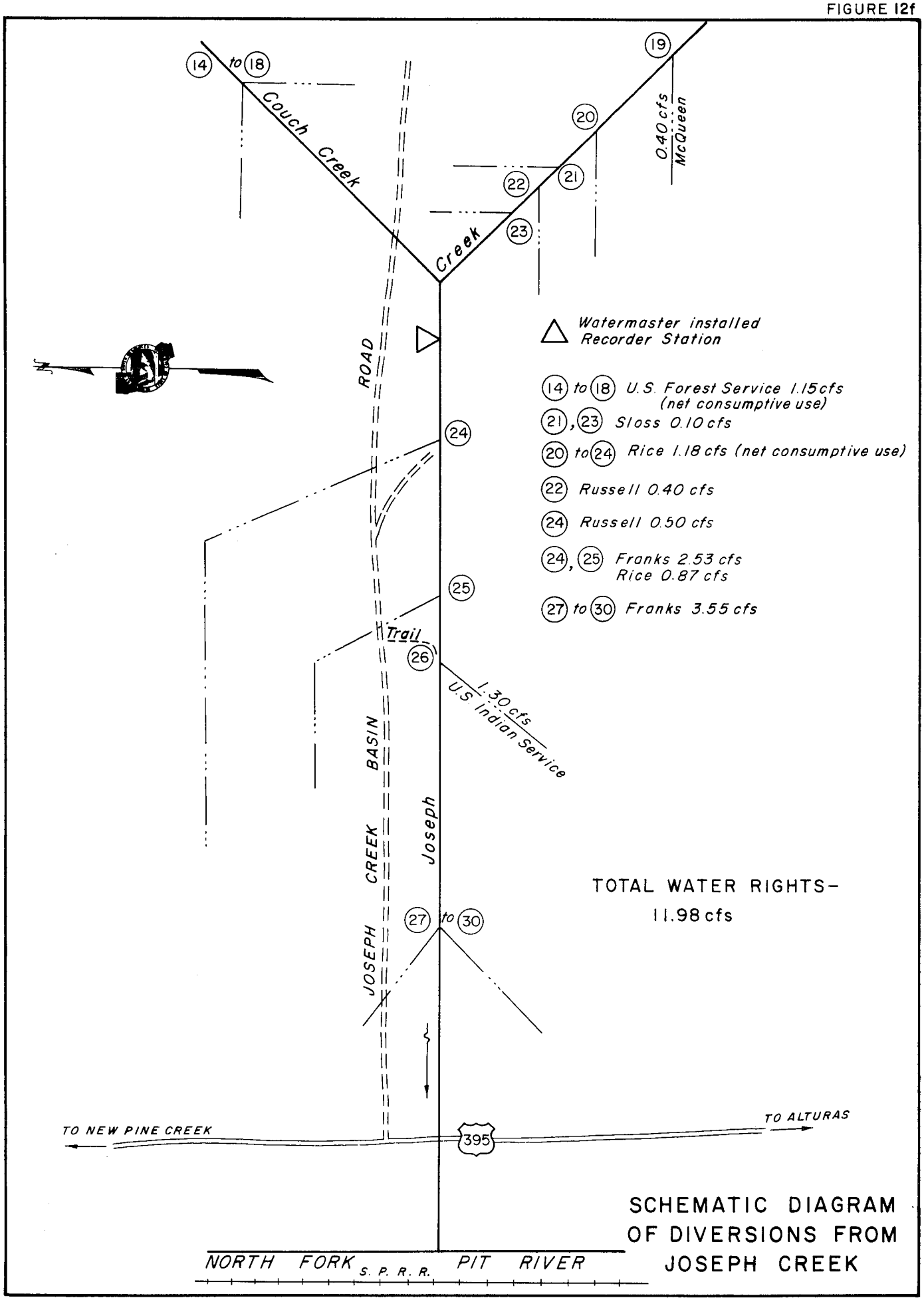
SCHEMATIC DIAGRAM OF DIVERSIONS FROM LINVILLE CREEK

FIGURE 12e



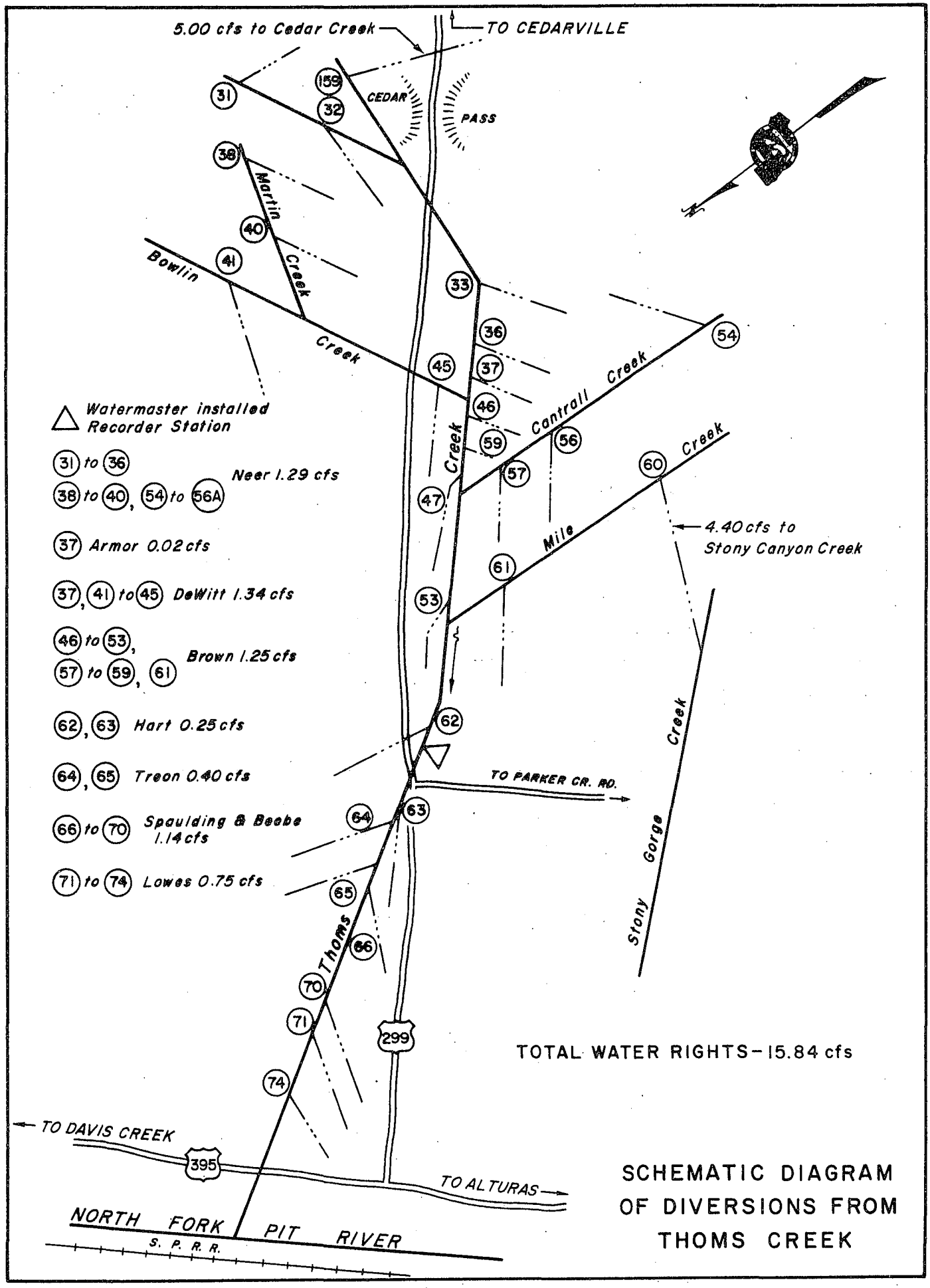
SCHEMATIC DIAGRAM OF DIVERSIONS FROM FRANKLIN CREEK

FIGURE 12f



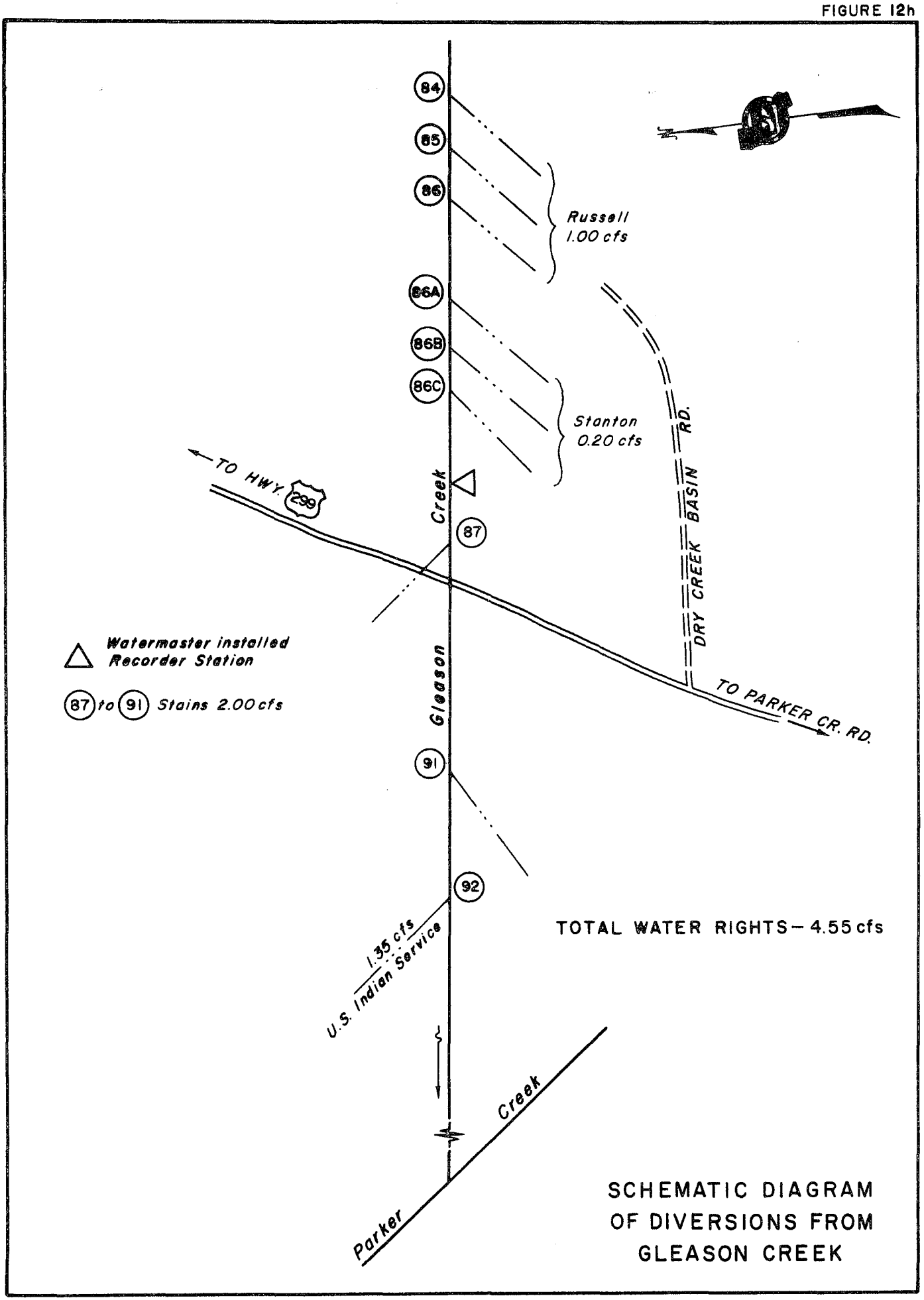
SCHEMATIC DIAGRAM OF DIVERSIONS FROM JOSEPH CREEK

FIGURE 12g



SCHEMATIC DIAGRAM OF DIVERSIONS FROM THOMS CREEK

FIGURE 12h



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
GLEASON CREEK

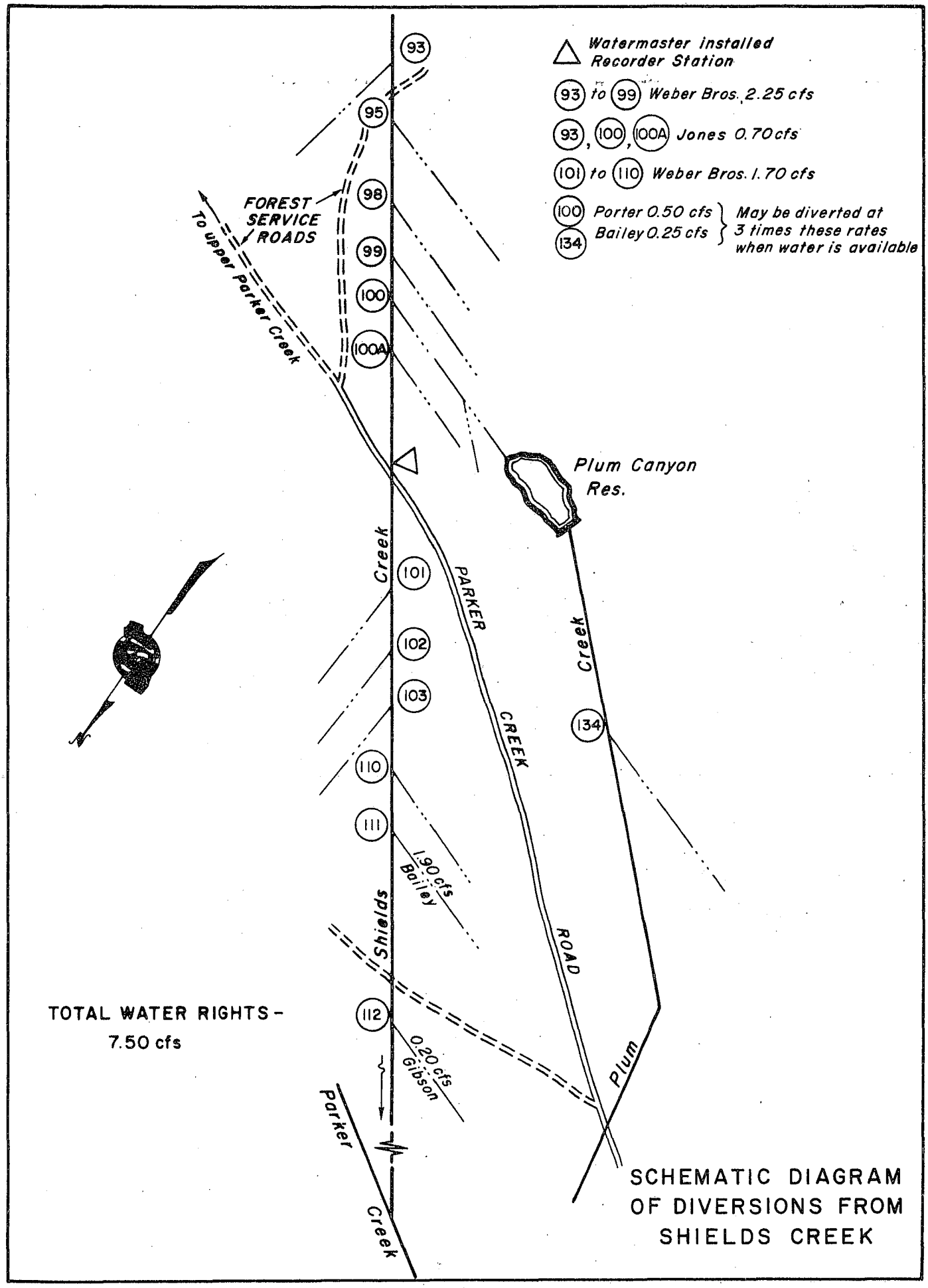

Watermaster installed Recorder Station
93 to 99 Weber Bros. 2.25 cfs
93, 100, 100A Jones 0.70 cfs
101 to 110 Weber Bros. 1.70 cfs
100 Porter 0.50 cfs
134 Bailey 0.25 cfs
May be diverted at 3 times these rates when water is available
FOREST SERVICE ROADS
To upper Parker Creek
Plum Canyon Res.
PARKER CREEK
Creek
Creek
ROAD
Shields
1.90 cfs Bailey
0.20 cfs Gibson
Plum
Parker
Creek
93
95
98
99
100
100A
101
102
103
110
111
112
134
TOTAL WATER RIGHTS - 7.50 cfs
SCHEMATIC DIAGRAM OF DIVERSIONS FROM SHIELDS CREEK

FIGURE 12j

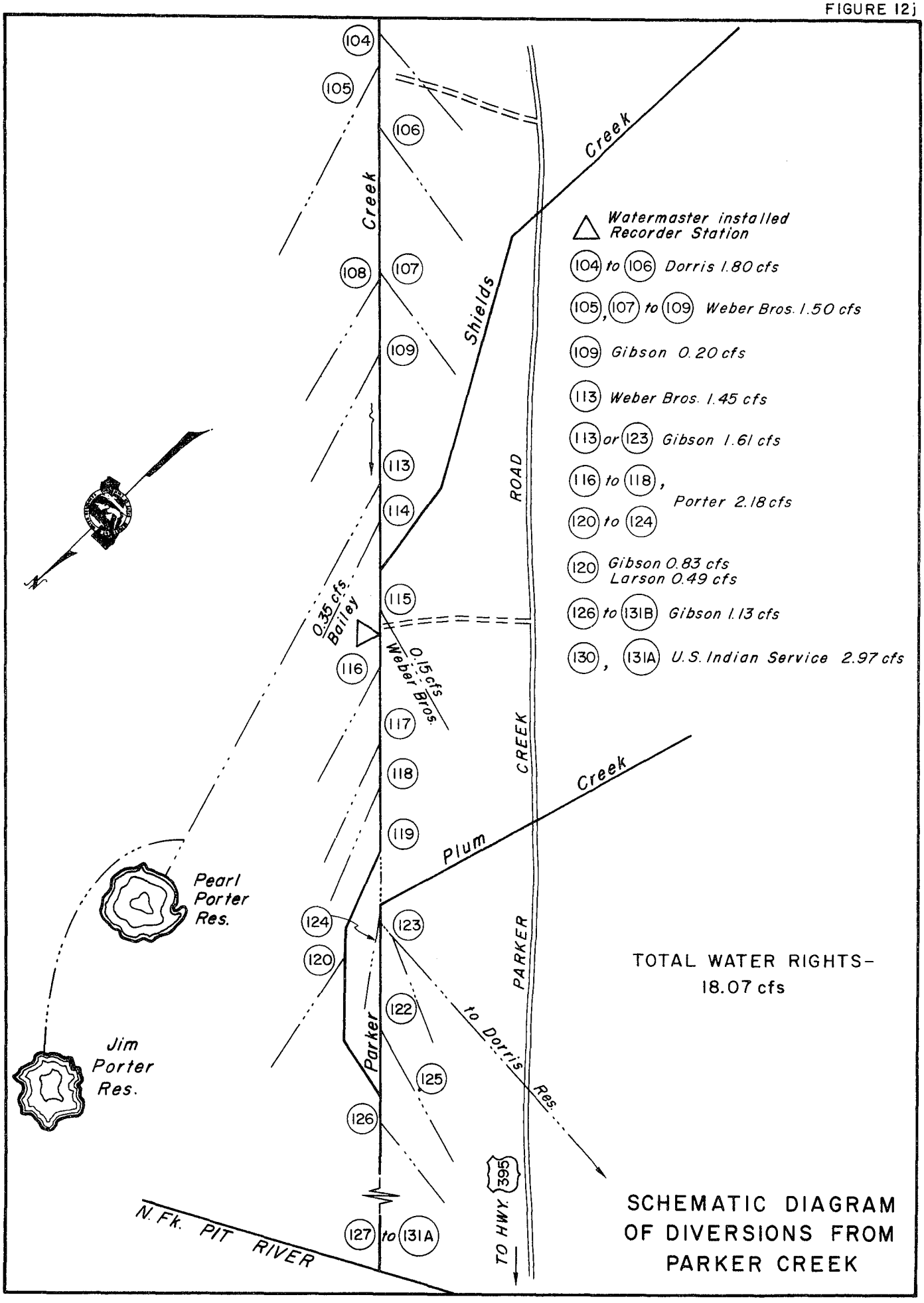
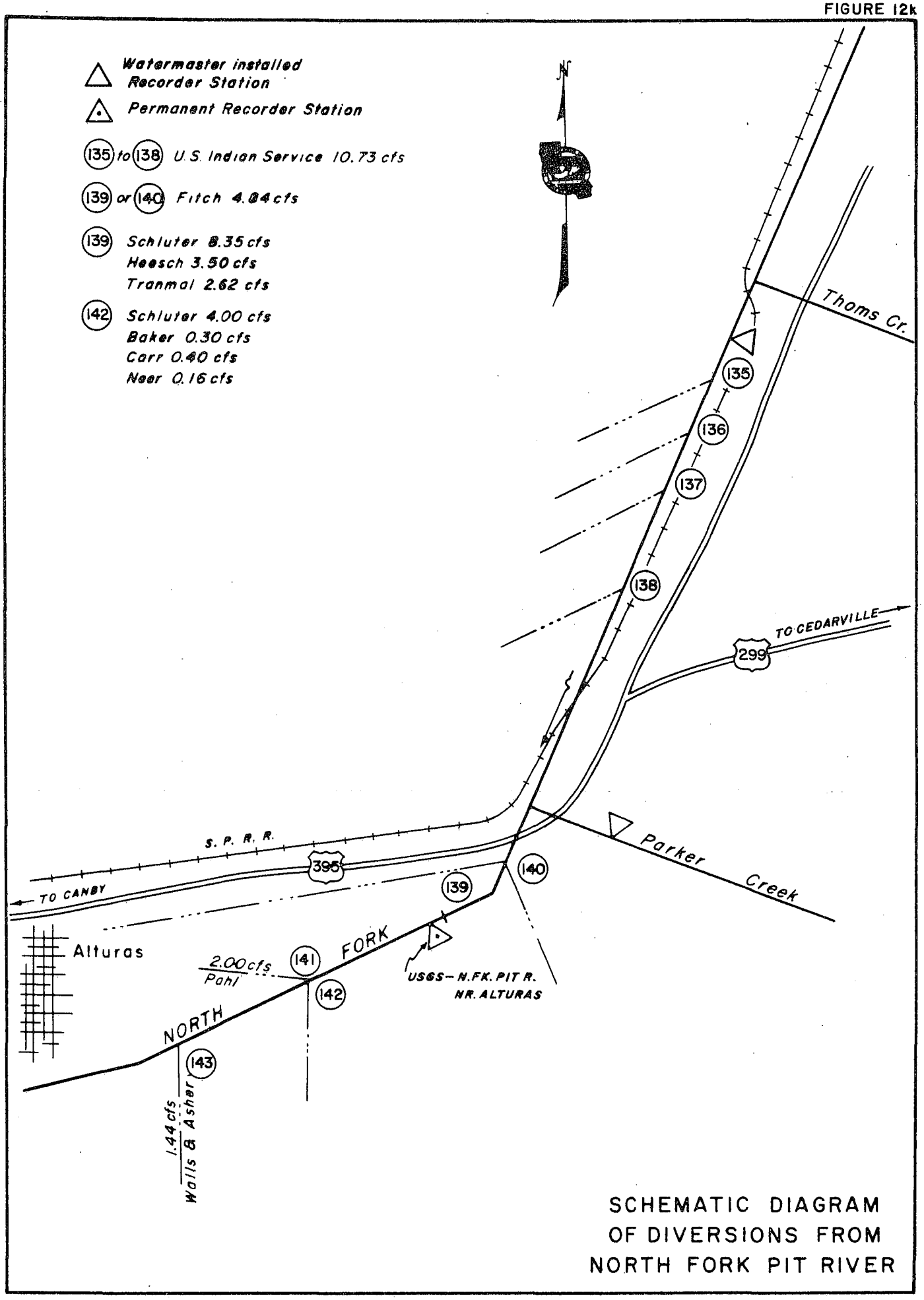

104
105
106
107
108
109
113
114
115
116
117
118
119
120
122
123
124
125
126
127 to 131A
Creek
Shields
ROAD
CREEK
PARKER
Plum
Creek
Parker
Creek
0.35 cfs. Bailey
0.15 cfs Weber Bros.
Pearl Porter Res.
Jim Porter Res.
to Dorris Res.
N. Fk. PIT RIVER
TO HWY. 395
Watermaster installed Recorder Station
104 to 106 Dorris 1.80 cfs
105, 107 to 109 Weber Bros. 1.50 cfs
109 Gibson 0.20 cfs
113 Weber Bros. 1.45 cfs
113 or 123 Gibson 1.61 cfs
116 to 118, 120 to 124 Porter 2.18 cfs
120 Gibson 0.83 cfs
Larson 0.49 cfs
126 to 131B Gibson 1.13 cfs
130, 131A U.S. Indian Service 2.97 cfs
TOTAL WATER RIGHTS-
18.07 cfs
SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
PARKER CREEK

FIGURE 12k



SCHEMATIC DIAGRAM OF DIVERSIONS FROM NORTH FORK PIT RIVER

Shackleford Creek Watermaster Service Area

The Shackleford Creek service area is located in western Siskiyou County near the town of Fort Jones in Scott Valley. There are 41 water right owners in the service area with total allotments of 64.73 cubic feet per second. The major sources of water supply for this service area are Shackleford Creek, which flows through the central part of Quartz Valley, and its tributary, Mill Creek, which rises east of the headwaters of Shackleford Creek. Evans Creek, a small tributary to Mill Creek, enters from the south.

The service area encompasses the Quartz Valley region of Scott Valley and includes the entire agricultural area within the Shackleford Creek Basin. It is about two miles wide by six miles long with the main axis and drainage running from south to north. Elevations on the agricultural area range from about 3,100 feet at the south to about 2,650 feet at the confluence of Shackleford Creek and Scott River.

A schematic drawing of the Shackleford Creek stream system is presented as Figures 13 and 13a, pages 76 and 77.

Water Supply

The water supply for Shackleford Creek is derived from snowmelt runoff, springs and seepage, and supplemental stored water released from Cliff Lake and Campbell Lake. These lakes are located near the headwaters of Shackleford Creek.

The watershed of the Shackleford Creek stream system contains about 31 square miles, located in the heavily forested, steep, mountainous terrain of the northeasterly slopes of the Salmon Mountains. It varies in elevation from about 7,000 feet along its west rim to about 3,000 feet at the foot of the slopes bordering Quartz Valley. Snowmelt runoff is normally sufficient to supply all demands until the middle of July. The supply then usually decreases until the first part of August when water is released from Cliff and Campbell Lakes to maintain sufficient flow for second priority allotments in the Shackleford Ditch.

There were no stream gaging stations operated in the Shackleford Creek service area during 1968. However, several stations were maintained in various diversion ditches.

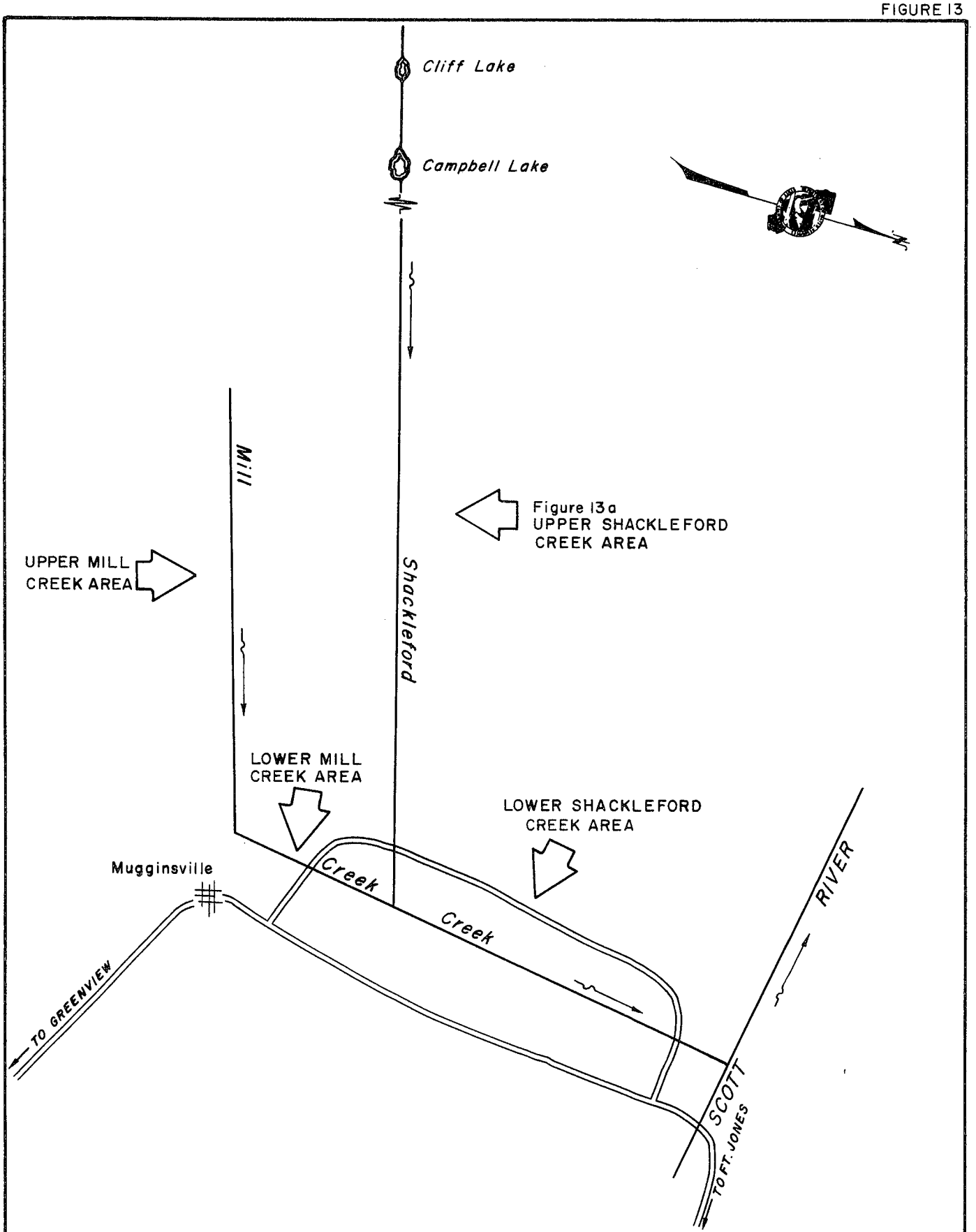
Method of Distribution

Irrigation is accomplished primarily by wild flooding of permanent pasture and alfalfa fields. Water is distributed by ditches and laterals to the places of use. Shackleford Ditch, the largest of these ditches, has a length of about six miles and a capacity of about 12 cubic feet per second.

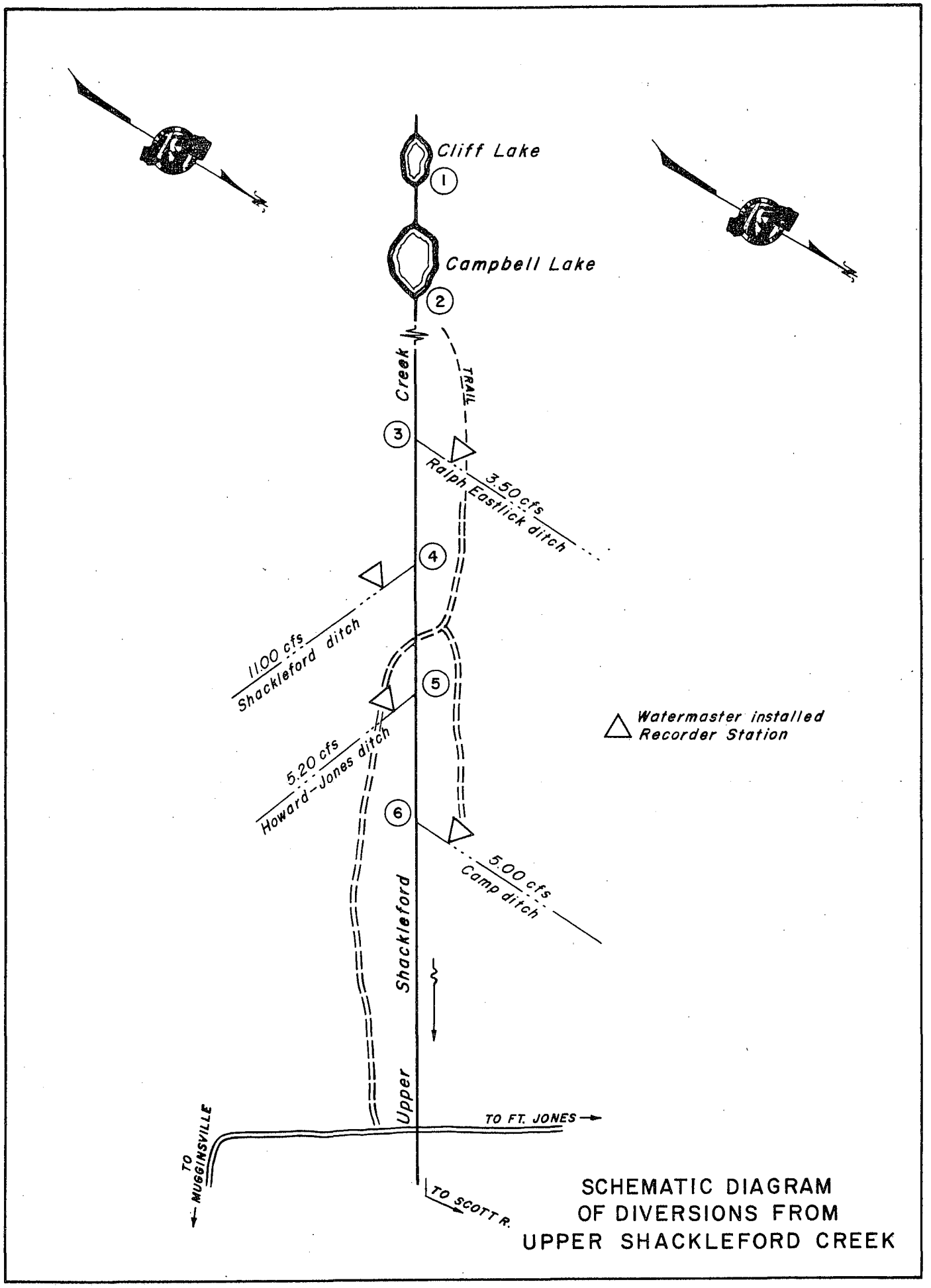
The Shackleford Creek decree (see Table 1) provides four separate areas of distribution within the service area and establishes the following number of priority classes for these areas: Upper Shackleford Creek - seven; Lower Shackleford Creek - seven; Upper Mill Creek - three; and Lower Mill Creek - two.

1968 Distribution

Watermaster service began June 1 in the Shackleford Creek service area and continued until September 30. John A. Nolan, Water Resources Technician II, was watermaster during this period. The available water supply was about normal early in the season but well below normal after August 1. Water right owners in the Howard-Jones Ditch did not use any of their water during the 1968 season. Their fourth priority allotment (seven priorities in the service area) were therefore available for use by owners of lower priorities.



SCHEMATIC DIAGRAM
OF SHACKLEFORD CREEK
WATERMASTER SERVICE AREA



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
UPPER SHACKLEFORD CREEK

Shasta River Watermaster Service Area

The Shasta River service area is located in the central part of Siskiyou County, south and east of the town of Yreka. There are 108 water right owners in the service area with total allotments of 594.612 cubic feet per second.

The source of water supply is Shasta River and its several tributaries. The upper reaches of the service area are served by two groups of tributaries. One group, comprising Boles, Beaughan, Carrick, and Jackson Creeks, rises on the northwestern slopes of Mount Shasta. The other group, consisting of Dale and Eddy Creeks, and Shasta River west of U. S. Highway 99, rises on the eastern slopes of the Trinity Mountains. All these streams join the main stem Shasta River above Dwinnell Reservoir near the town of Weed. As the Shasta River flows northward from Dwinnell Reservoir to its confluence with the Klamath River, north of Yreka, it is joined by three major tributaries. Parks Creek, rising on the eastern slopes of the Trinity Mountains, enters from the west near the town of Gazelle. Big Springs Creek, from Big Springs Lake, enters from the east about a mile below Parks Creek. Little Shasta River, rising on the western slopes of the mountainous area between Butte Valley and Shasta Valley, enters from the east near the town of Montague.

The place of use is in Shasta Valley which is approximately 30 miles long and 30 miles wide. The valley has numerous small, coneshaped, volcanic hillocks scattered throughout its central portion that produce the effect of dividing the area into a number of distinctively separate parts. Because of these formations only about 141,000 acres of the approximately 507,000 acres within the valley are irrigable. The valley floor elevation averages approximately 3,000 feet.

A schematic drawing of each major stream system within the Shasta River service area is presented as Figures 14 through 14i, pages 85 through 94.

Water Supply

The water supply for Shasta Valley is derived from snowmelt runoff, springs and underground flow, and occasional summer thunder showers. In several portions of the stream system the spring and underground flow is adequate to supply most allotments throughout the season. Much of the underground flow is derived from the northern slopes of Mount Shasta, which rises to an elevation of 14,162 feet at the south end of Shasta Valley. Although the snowpack on Mount Shasta is usually heavy, there is negligible surface runoff.

Parks Creek, Upper Shasta River, and Little Shasta River derive a major portion of their water supply from snowmelt runoff. This flow is usually adequate to supply all allotments until the middle of May.

Beaughan Creek, Carrick Creek, Shasta River from Boles Creek to Dwinnell Reservoir, Big Springs, and Lower Shasta River have enough runoff from springs to supply a large percentage of the allotments throughout the season.

Records of the daily mean discharge at several stream gaging stations in the Shasta River service area are presented in Tables 30 through 36, pages 82 through 84.

Methods of Distribution

Irrigation of permanent pasture and alfalfa lands is accomplished principally by wild flooding. Much of the return water is recaptured and

used on lower pasture lands. Sprinkling systems are used for irrigating some alfalfa and grain lands.

Water is diverted primarily by diversion dams and then conveyed by ditch or canal to the place of use. The largest and longest canal in the area is the Edson-Foulke Yreka Ditch, which has a capacity of about 60 cubic feet per second and a length of about 15 miles. Water is also supplied into ditch systems by pumped diversions. The largest of these belong to three irrigation districts. Several riparian water right owners also use pump diversions.

Many privately owned storage reservoirs exist in the area. Water storage from these reservoirs is used to supplement continuous flow allotments.

The Shasta River decree (see Table 1) provides eight separate areas of distribution within the service area. This decree established the following number of priority classes for these areas: Shasta River above the confluence with Big Springs Creek - 43; Jackson Creek - 7; Parks Creek - 25; Shasta River below the confluence with Big Springs Creek - 29; and Little Shasta River - 7.

Three privately operated water districts within the service area have main diversions which are under supervision of the watermaster. These are: Shasta River Water Users Association, Grenada Irrigation District, and Big Springs Irrigation District. A fourth, the Montague Water Conservation District, stores water in Dwinnell Reservoir for use by the District and by natural flow water right owners immediately below the dam. The watermaster is responsible for diversion to these users.

A number of riparian water users along the Lower Shasta River were not included in the Shasta River decree. Owners of these undefined water rights are therefore not subject to watermaster supervision; consequently, in seasons of short supply these rights can be the cause of many water distribution problems.

1968 Distribution

Watermaster service began April 1 in the Shasta River service area and continued through September 30. John A. Nolan, Water Resources Technician II, was watermaster during this period.

The available water supply in the service area was generally below average during the season.

Parks Creek. The flow in Parks Creek was sufficient to supply all allotments (25 priorities) until early June. Some water continued to be diverted into the Yreka Ditch until July 1. The first priority allotments of six cubic feet per second were available until August 9, after which first priority allotments were available in decreasing amounts for the remainder of the season. Water users downstream from the lowest first priority diversion received a portion of their allotments during the latter part of the season from return flow and from water rising in the gravel streambed.

Upper Shasta River. During early spring enough water was available to satisfy all allotments (eight priorities). As the flow decreased, the following levels of priority allotments were met: June 19 - all of fourth priority; June 28 - all of third priority (Yreka Ditch main allotment); and August 31 (the seasonal low) - 20 percent of third priority.

Shasta River from Boles Creek to Dwinnel Reservoir. Boles Creek and Shasta River from Boles Creek to Dwinnell Reservoir were operated as one stream, under a long-standing oral agreement among the water right owners, with water being distributed on an equal and correlative basis. Adequate water was available to satisfy all allotments until the middle of August. All diversions were then cut to 80 percent. Early in September the flow increased to again allow diversion of 100 percent of allotments.

Beaughan Creek. The flow of Beaughan Creek was sufficient to satisfy most demands (five priorities) for the entire season. The creek is routed through a mill pond owned by the International Paper Company which uses approximately 35 percent of the flow for industrial purposes.

Carrick Creek. The water supply in Carrick Creek was adequate to satisfy all allotments (13 priorities) during the entire irrigation season.

Little Shasta River. Enough water was available in the Little Shasta River to satisfy all fifth priority allotments (seven priorities) until early May. After that date, close regulation became necessary to adequately distribute this priority. The flow continued to decrease to approximately 65 percent of the third priority allotments by the first week in August. It then stayed constant for the remainder of the season.

The daily mean discharge of Little Shasta River near Montague is presented in Table 34, page 84. This runoff is augmented by rising water along the river channel, and by substantial inflow from Cleland Springs, a tributary approximately two miles below the stream gaging station. Therefore, considerably more water is usually available for distribution at downstream diversion points than is indicated in the discharge table.

Dwinnell Reservoir. Releases from Dwinnell Reservoir to the Montague Water Conservation District commenced on April 7 and continued into October. Reservoir operation data from the 1968 season are shown in Tables 32 and 33, pages 83 and 84.

By agreement with the Montague Water Conservation District, water users on Shasta River below Dwinnell Reservoir received stored water from the reservoir on demand in lieu of their natural flow rights. The agreement allotment totals and the amount delivered to each user this season are shown in the tabulation below.

Big Springs. The flow of Big Springs was sufficient to satisfy the first and second priority allotments and approximately 50 percent of the third priority allotments through the first half of the season. Then in July, August, and September, the flow in Big Springs increases as snowmelt from higher elevations on Mount Shasta percolates into the ground and reappears as surface flow at Big Springs Lake.

DELIVERIES TO NATURAL FLOW WATER RIGHT OWNERS
BELOW DWINNELL RESERVOIR - 1968

Name of Water Right Owner	Allotment in Acre-feet	Allotment Delivered from Dwinnell Reservoir	
		Acre-feet	% of Allotment
Flying 'L' Ranch	198	50	25
Frank Ayers	464	464	100
J. N. Taylor	1,200	1,200	100
W. W. Valentine			
Hole-in-the Ground Ranch	596	596	100
Seldom Seen Ranch	924	924	100
Totals	3,382	3,234	96

As a result, Big Springs Irrigation District, a third priority water right owner, was able to pump its full allotment from mid-July on through the remainder of the season.

Lower Shasta River. The water supply in Lower Shasta River was sufficient to satisfy all allotments (29 priorities) for almost the entire season. However, during July and August close regulation was necessary to adequately distribute the flow to the first priority water right owners at the lower end of the river as on numerous occasions the available flow was insufficient to supply all priorities.

SHASTA RIVER WMSA

TABLE 30
DAILY MEAN DISCHARGE
SHASTA RIVER AT EDGEWOOD
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	181	90	41	51	22	13	
2	176	99	41	50	21	13	
3	165	109	41	56	20	15	
4	150	85	44	63	20	14	
5	147	76	52	70	20	13	
6	173	76	55	63	21	14	
7	145	69	48	142	21	14*	
8	133	63	44	96	20		
9	122	59	43	73	20		
10	113	55	43	62	19		
11	105	53	48	51	18		
12	95	66	53	46	18		
13	124	73	51	46	18		
14	145	66	50	44	19		
15	155	63	47	42	19		
16	140	62	44	38	18		
17	267	56	42	35	17		
18	160	52	42	35	16		
19	133	44	43	35	16		
20	120	37	101	36	17		
21	113	37	150	37	16		
22	109	34	103	33	16		
23	105	33	94	32	16		
24	101	38	87	31	15		
25	98	42	73	30	15		
26	109	38	70	38	15		
27	101	36	59	26	15		
28	90	36	57	23	14		
29	75	37	59	22	14		
30	75	38	60	23	14		
31	85		56		14		
Mean	129	57.4	59.4	47.6	17.5	13.7	
Runoff in acre-feet	7930	3420	3650	2830	1080	190	

* End of Record

SHASTA RIVER WMSA

TABLE 31
DAILY MEAN DISCHARGE
PARKS CREEK ABOVE EDSON-FOULKE YREKA DITCH
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1			28	23	8.2	6.3	1.9
2			28	23	8.2	6.2	1.9
3			30	22	8.2	6.2	1.9
4			33	24	8.0	6.2	1.6
5		28*	30	54	8.0	6.2	1.6
6		28	24	39	8.0	6.0	1.6
7		30	23	31	8.0	6.0	1.6
8		31	24	28	7.8	6.0	1.6
9		32	27	25	7.8	6.0	1.5
10		32	30	24	7.8	5.8	1.5
11		32	28	23	7.5	5.8	1.5
12		33	25	18	7.2	5.8	1.5
13		27	24	16	7.2	5.8	1.5
14		26	22	15	7.2	5.6	1.6
15		26	21	12	7.0	5.6	1.6
16		24	22	11	6.8	5.2	1.6
17		22	22	8.8	6.5	5.0	1.8
18		21	22	8.6	6.5	4.9	1.9
19		19	23	8.2	6.5	4.7	2.2
20		17	23	8.2	6.3	4.5	2.5
21		16	24	8.3	6.3	4.2	2.7
22		15	23	9.2	6.2	3.5	2.7
23		16	23	8.8	6.2	3.4	2.7
24		15	24	8.2	6.2	3.4	2.7
25		15	25	8.6	5.8	3.0	2.9
26		17	26	8.8	5.8	2.5	2.9
27		19	26	8.8	5.6	2.3	2.9
28		20	26	8.6	5.4	2.2	2.9
29		25	26	8.6	5.4	2.0	2.9**
30		27	24	8.6	5.2	2.0	
31			23		5.4	1.9	
Mean		23.6	25.1	16.9	6.8	4.6	2.1
Runoff in acre-feet		1220	1540	1010	421	286	118

* Beginning of Record
** End of Record

TABLE 32
DAILY MEAN STORAGE IN DWINNELL RESERVOIR

October 1, 1967 through September 30, 1968 (in acre-feet)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19,580	19,080	19,930	21,750	26,270	33,750	36,930	31,600	26,210	21,190	13,585	8,515
2	19,610	19,090	20,045	21,780	26,360	33,940	36,980	31,265	26,045	20,910	13,385	8,320
3	19,580	19,105	20,045	21,810	26,510	34,110	37,030	30,990	25,880	20,690	13,210	8,165
4	19,525	19,120	20,200	21,820	26,765	34,280	37,050	30,770	25,730	20,450	12,990	7,870
5	19,500	19,135	20,660	21,850	26,945	34,450	37,070	30,530	25,850	20,185	12,760	7,730
6	19,470	19,150	20,730	21,860	27,050	34,585	37,050	30,290	26,150	19,920	12,440	7,600
7	19,440	19,160	20,800	21,890	27,110	34,720	36,950	30,050	26,225	19,650	12,240	7,450
8	19,400	19,200	20,885	21,920	27,215	34,810	36,795	29,810	26,225	19,400	12,080	7,330
9	19,370	19,200	20,940	21,990	27,290	34,890	36,625	29,570	26,195	19,120	11,950	7,155
10	19,360	19,200	20,995	22,060	27,380	34,940	36,455	29,375	26,120	18,855	11,850	7,020
11	19,330	19,220	21,050	22,090	27,455	35,095	36,235	29,180	25,955	18,435	11,680	6,870
12	19,300	19,220	21,110	22,170	27,545	35,180	36,065	29,000	25,775	18,140	11,450	6,725
13	19,275	19,230	21,120	22,520	27,620	35,300	35,860	28,805	25,550	17,895	11,170	6,500
14	19,245	19,330	21,120	23,190	27,695	35,490	35,640	28,625	25,310	17,690	10,960	6,480
15	19,220	19,400	21,150	24,050	27,800	35,660	35,435	28,445	25,070	17,480	10,770	6,400
16	19,190	19,440	21,165	24,665	27,890	35,860	35,215	28,250	24,830	17,220	10,610	6,305
17	19,160	19,485	21,220	24,725	28,100	36,080	35,010	28,055	24,575	16,975	10,430	6,225
18	19,120	19,515	21,235	24,890	28,325	36,250	34,740	27,890	24,350	16,750	10,240	6,110
19	19,050	19,540	21,260	25,025	28,630	36,340	34,500	27,770	24,080	16,530	10,130	6,025
20	19,030	19,555	21,290	25,160	29,075	36,420	34,225	27,725	23,840	16,320	10,070	5,910
21	19,065	19,570	21,320	25,265	29,665	36,490	33,990	27,695	23,600	16,110	9,910	5,840
22	19,020	19,580	21,345	25,355	30,380	36,570	33,700	27,665	23,360	15,900	9,800	5,735
23	19,020	19,595	21,400	25,475	31,200	36,590	33,395	27,560	23,140	15,690	9,660	5,625
24	19,020	19,625	21,430	25,550	31,900	36,625	33,225	27,470	22,915	15,525	9,550	5,520
25	19,020	19,640	12,460	25,625	32,380	36,710	32,970	27,320	22,705	15,285	9,430	5,430
26	19,030	19,650	21,500	25,700	32,720	36,780	32,750	27,200	22,440	15,055	9,300	5,340
27	19,050	19,680	21,555	25,775	33,020	36,795	32,560	27,050	22,200	14,815	9,120	5,250
28	19,065	19,720	21,600	25,925	33,280	36,810	32,350	26,900	21,960	14,590	8,990	5,180
29	19,065	19,780	21,640	26,000	33,530	36,830	32,160	26,765	21,695	14,350	8,885	5,115
30	19,080	19,860	21,680	26,030		36,850	31,840	26,570	21,445	14,135	8,760	5,050
31	19,090		21,710	26,120		36,880		26,375		13,905	8,630	

TABLE 33
DAILY MEAN RELEASES
DWINNELL RESERVOIR

April through October 1968
(In second-feet)

Day	April	May	June	July	August	September	October
1		78	67	78	77	41	22
2		78	66	77	77	50	22
3		78	68	79	74	56	28
4		78	68	79	69	57	31
5		78	64	81	69	60	33
6		79	56	84	69	60	33
7	50*	78	30	84	66	59	31
8	50	78	24	84	60	57	31
9	53	77	26	84	56	52	31
10	59	73	44	84	23	47	28
11	69	71	57	84	23	46	15**
12	72	69	62	84	61	47	
13	72	68	69	83	67	45	
14	73	67	72	82	70	33	
15	75	64	74	81	72	24	
16	75	64	74	81	74	26	
17	73	63	74	81	73	28	
18	73	55	77	77	73	30	
19	73	51	77	74	66	31	
20	73	60	77	73	56	31	
21	73	60	77	73	55	28	
22	74	62	77	73	51	30	
23	79	70	77	73	50	37	
24	79	70	77	75	50	37	
25	79	70	77	79	49	36	
26	77	70	78	79	45	36	
27	73	69	78	79	45	33	
28	66	68	78	79	48	26	
29	71	68	78	78	42	23	
30	77	70	78	78	42	23	
31		70		77	41		
Mean	70.3	69.5	66.7	79.2	57.8	39.6	27.7
Runoff in acre-feet	3350	4270	3970	4870	3560	2360	605

* Beginning of record
** End of record

TABLE 34
DAILY MEAN DISCHARGE
LITTLE SHASTA RIVER NEAR MONTAGUE

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	24	20	9.9	5.6	3.6	3.2	2.6
2	19	20	9.5	5.6	3.4	3.2	2.6
3	19	15	9.1	5.9	3.4	3.2	2.6
4	18	15	9.1	5.6	3.4	2.8	2.4
5	20	16	8.7	9.1	3.2	2.8	2.2
6	16	15	8.7	8.3	3.0	2.8	2.2
7	15	14	8.7	6.2	3.0	2.8	2.2
8	13	15	8.7	5.6	3.0	3.2	2.2
9	12	16	8.3	5.6	3.0	3.0	2.2
10	11	17	7.9	5.4	2.8	2.8	2.2
11	11	18	9.1	5.4	2.8	2.6	2.2
12	11	16	8.7	5.1	2.8	2.6	2.4
13	10	14	9.9	5.1	2.8	2.6	2.6
14	12	14	11	5.1	2.8	3.2	3.0
15	10	14	9.1	5.1	3.0	2.8	2.8
16	11	14	8.3	4.8	3.0	3.2	2.6
17	11	12	7.9	4.8	3.0	2.8	2.4
18	12	12	7.5	4.8	3.0	3.6	2.4
19	11	12	8.3	4.5	3.0	5.4	2.4
20	11	11	12	4.2	3.0	5.1	2.6
21	11	11	11	4.2	2.8	4.0	2.6
22	12	11	12	4.2	2.8	3.6	2.4
23	13	11	9.5	4.2	2.8	3.4	2.4
24	14	11	8.7	4.2	2.8	3.2	2.4
25	23	10	8.3	4.2	2.8	3.2	2.4
26	18	10	7.5	3.8	2.8	3.8	2.8
27	15	10	7.1	3.8	2.6	3.2	2.6
28	15	10	6.5	3.8	2.6	3.0	2.8
29	17	10	6.2	3.8	2.6	2.8	2.8
30	19	9.9	5.9	3.6	2.6	2.6	2.8
31	20		5.9		2.6	2.6	
Mean	14.6	13.5	8.7	5.1	2.9	3.2	2.4
Runoff in acre-feet	900	801	534	301	180	197	148

TABLE 35
DAILY MEAN DISCHARGE
SHASTA RIVER AT MONTAGUE-GRENADA HIGHWAY BRIDGE

March through September 1968
(In second-feet)

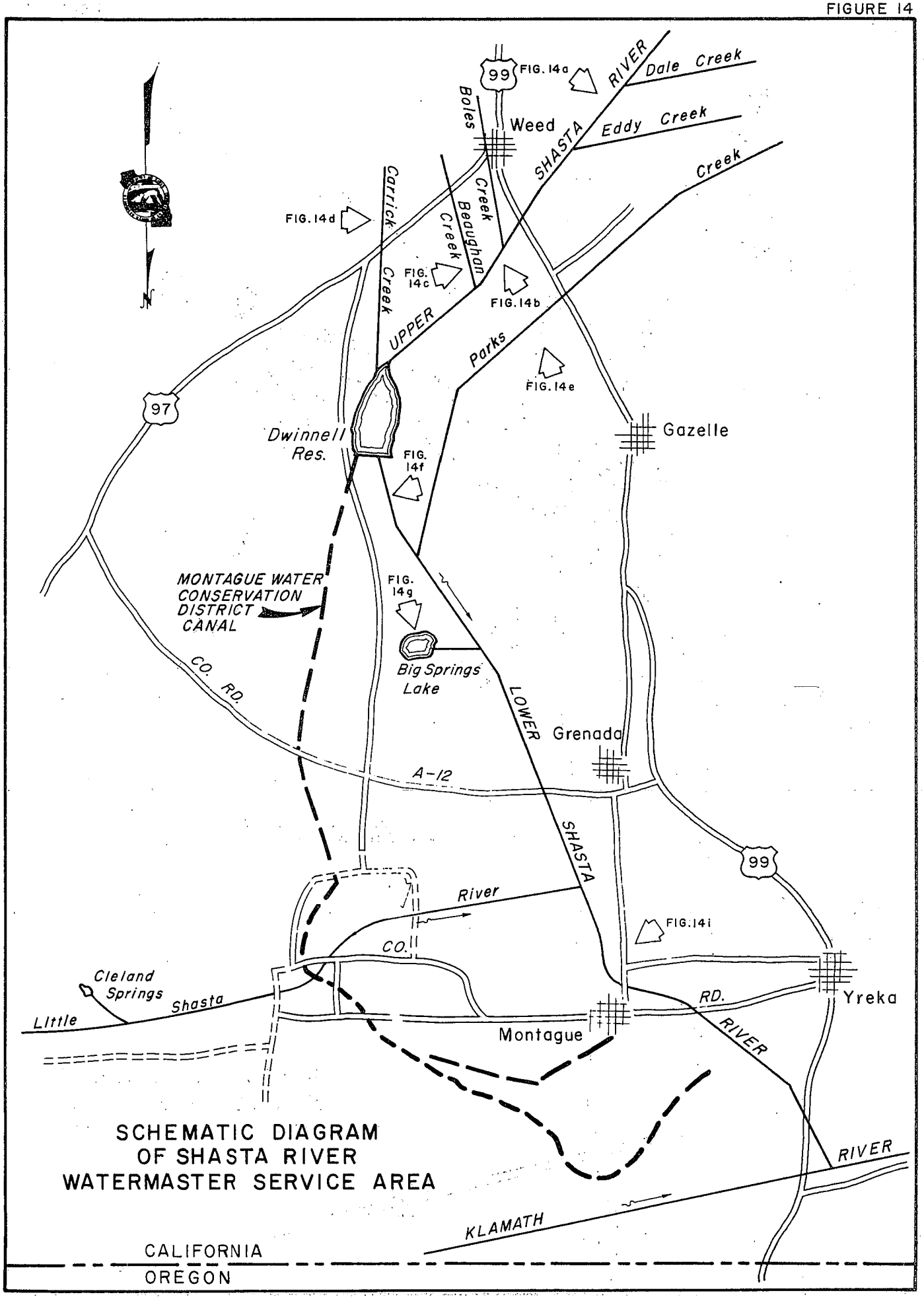
Day	March	April	May	June	July	August	September
1			46	38	18	17	50
2			39	32	20	24	54
3			35	33	23	30	45
4			30	52	20	22	24
5			31	48	24	17	26
6			41	170	25	20	33
7			44	140	18	17	33
8			48	120	15	24	31
9			39	71	18	30	25
10			33	69	17	24	33
11			38	60	16	22	38
12		36*	39	54	16	19	41
13		49	38	55	20	18	43
14		38	35	45	25	30	34
15		48	37	39	20	26	38
16		48	34	41	20	28	36
17		51	35	44	17	33	40
18		65	36	30	21	28	28
19		63	39	31	25	32	34
20		52	42	25	26	56	53
21		39	53	23	31	74	68
22		39	118	20	39	103	80
23		36	108	24	35	59	81
24		38	108	21	24	47	99
25		39	103	20	21	45	162
26		42	108	24	22	59	135**
27		53	135	19	26	38	
28		45	108	16	22	39	
29		48	62	18	20	44	
30		51	38	16	15	52	
31			35		15	47	
Mean		46.3	55.9	46.6	21.7	36.2	52.5
Runoff in acre-feet		1740	3440	2770	1340	2230	2710

* Beginning of Record
** End of Record

TABLE 36
DAILY MEAN DISCHARGE
SHASTA RIVER NEAR YREKA

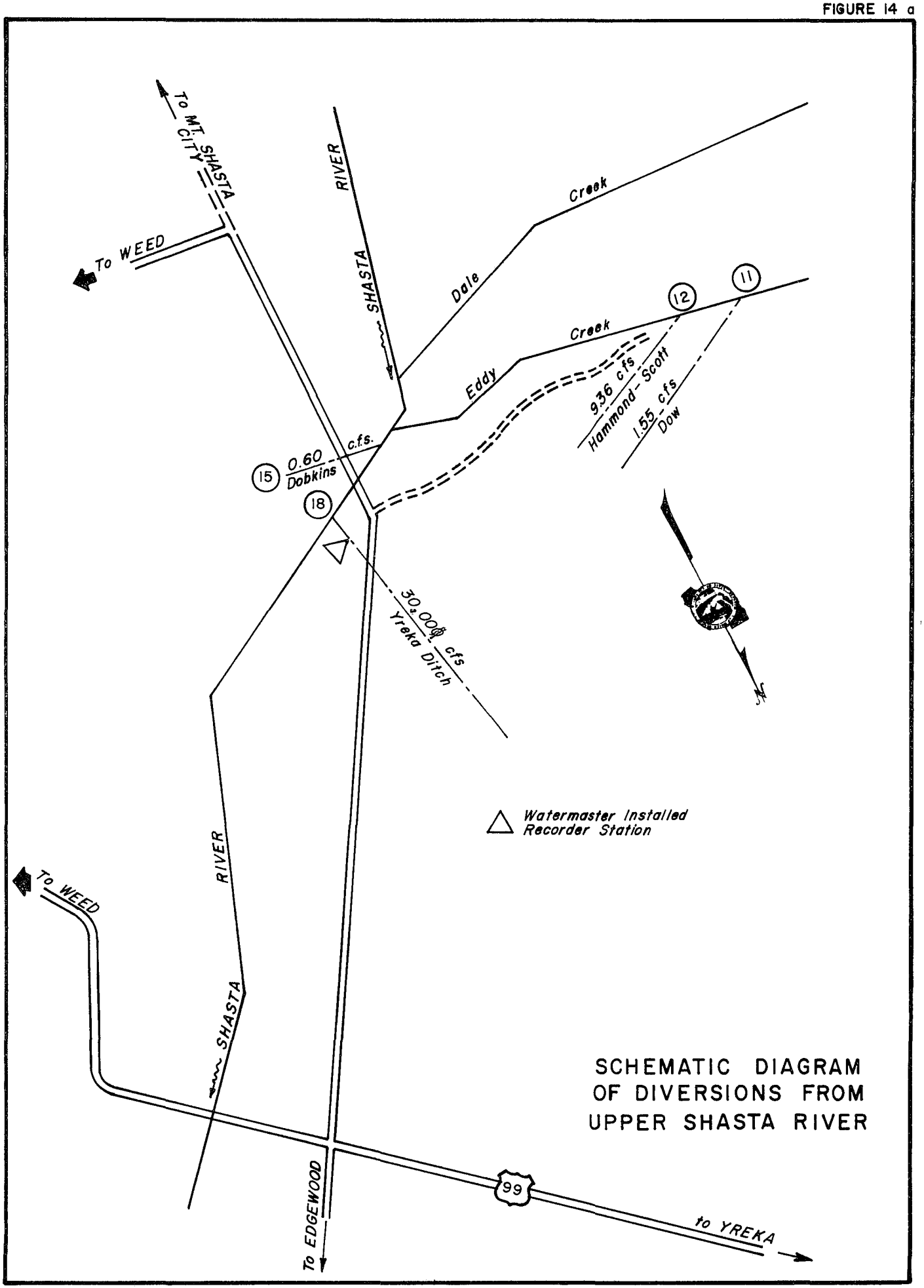
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	279	103	64	49	10	11	61
2	264	99	53	50	13	11	61
3	256	93	45	49	16	25	55
4	254	103	45	61	18	24	39
5	248	107	38	75	13	17	30
6	243	70	43	109	19	11	37
7	237	56	58	111	15	14	42
8	232	52	61	109	7.9	14	42
9	225	53	53	89	7.4	33	39
10	217	49	45	80	8.5	36	34
11	212	46	46	80	8.6	21	58
12	210	33	53	64	7.6	21	67
13	237	46	56	68	5.8	19	48
14	237	48	53	61	6.7	17	34
15	215	49	58	53	9.6	30	29
16	204	58	53	48	7.9	23	41
17	221	53	55	50	7.6	36	39
18	212	70	58	43	7.3	37	41
19	201	78	53	36	4.9	36	37
20	199	73	62	28	7.3	59	49
21	193	59	64	19	8.2	71	68
22	189	58	101	17	23	87	68
23	183	58	103	19	19	67	76
24	175	56	97	24	23	59	73
25	188	52	99	18	15	52	85
26	186	53	95	15	18	61	87
27	186	62	97	22	15	62	87
28	178	64	99	17	19	42	99
29	175	65	80	14	15	56	99
30	151	62	59	14	10	61	97
31	111		46		8.2	59	
Mean	210	64.3	64.3	49.7	12.1	37.8	57.4
Runoff in acre-feet	12930	3820	3950	2960	743	2320	3420

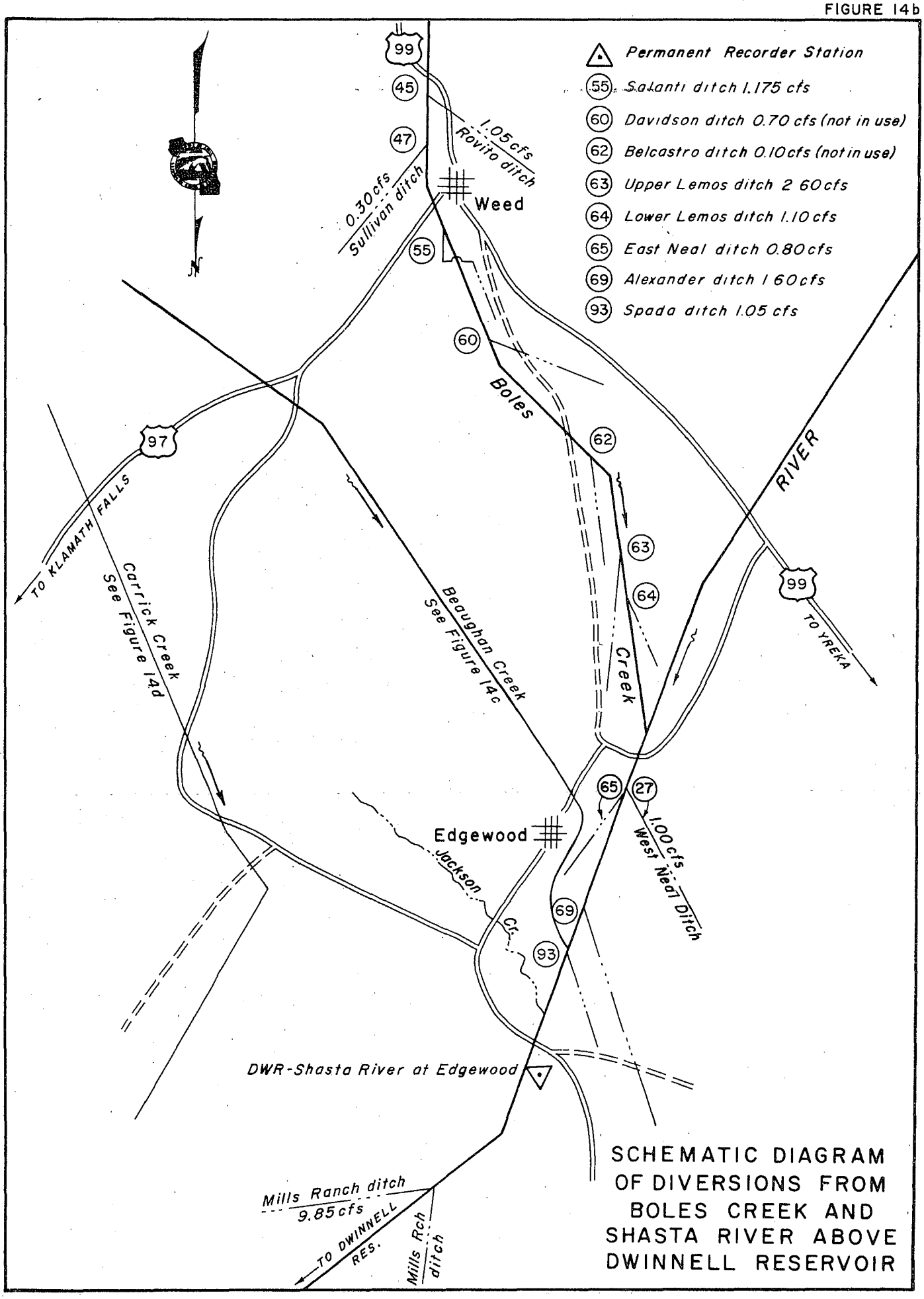


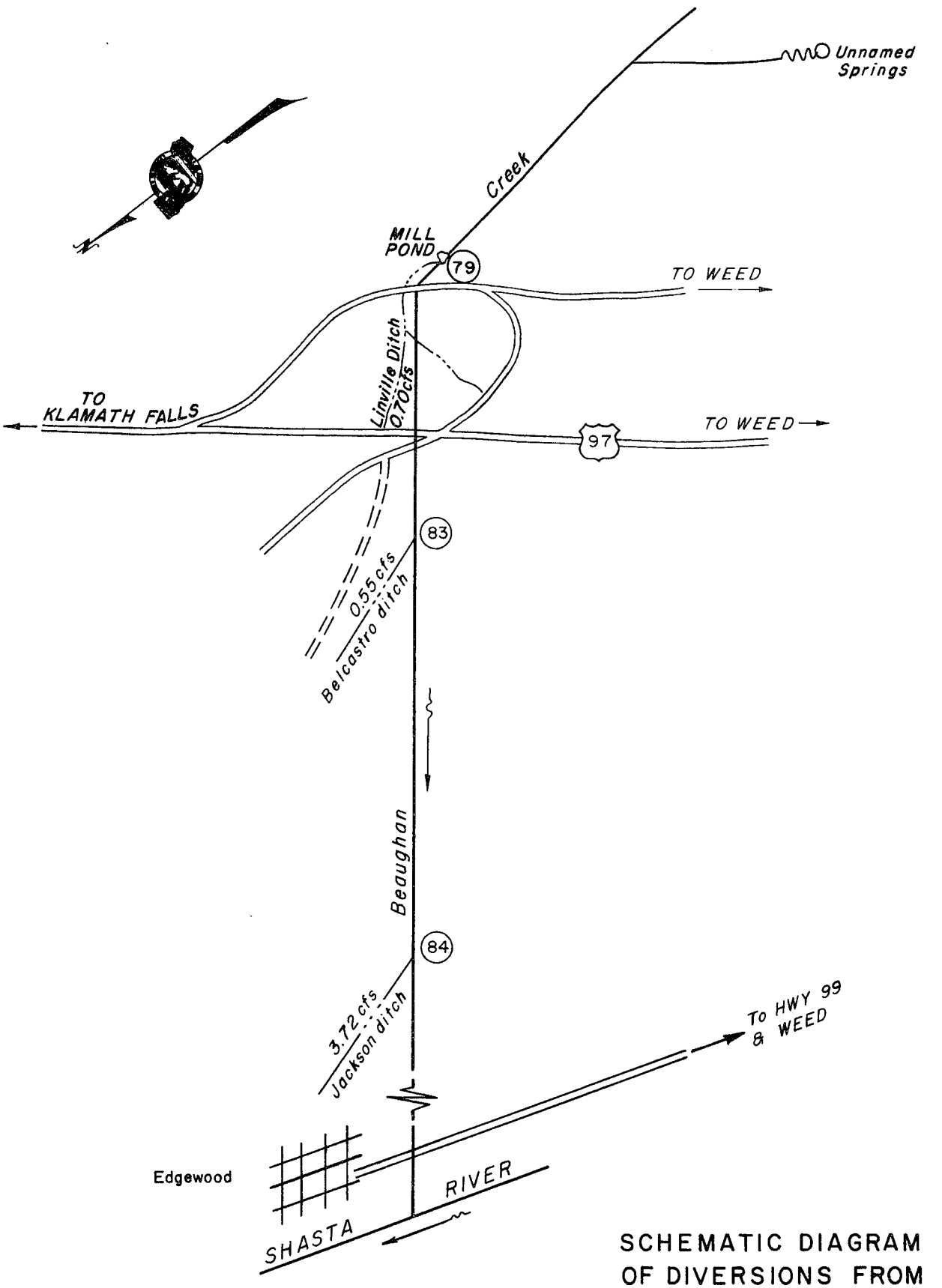
SCHEMATIC DIAGRAM
OF SHASTA RIVER
WATERMASTER SERVICE AREA

FIGURE 14 a

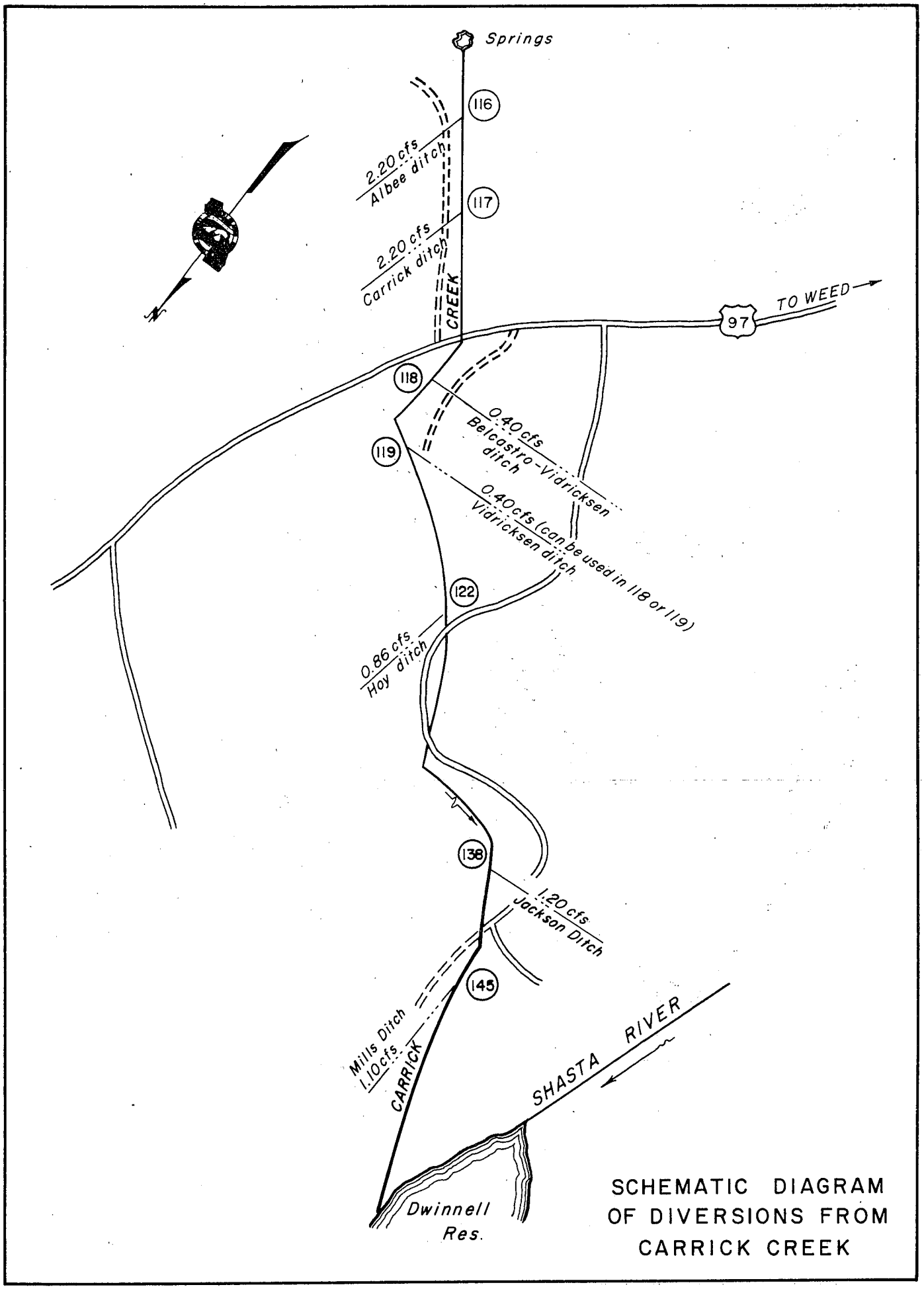


SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
UPPER SHASTA RIVER


Permanent Recorder Station
55 Salanti ditch 1.175 cfs
60 Davidson ditch 0.70 cfs (not in use)
62 Belcastro ditch 0.10cfs (not in use)
63 Upper Lemos ditch 2 60cfs
64 Lower Lemos ditch 1.10 cfs
65 East Neal ditch 0.80cfs
69 Alexander ditch 1 60cfs
93 Spada ditch 1.05 cfs
99
45
47
1.05 cfs Rovito ditch
0.30cfs Sullivan ditch
Weed
55
60
Boles
97
62
RIVER
TO KLAMATH FALLS
Carrick Creek See Figure 14d
Beaughan Creek See Figure 14c
63
64
Creek
99
TO YREKA
65
27
1.00 cfs West Neal Ditch
Edgewood
Jackson Cr.
69
93
DWR-Shasta River at Edgewood
Mills Ranch ditch 9.85cfs
TO DWINNELL RES.
Mills Rch ditch
SCHEMATIC DIAGRAM OF DIVERSIONS FROM BOLES CREEK AND SHASTA RIVER ABOVE DWINNELL RESERVOIR



SCHEMATIC DIAGRAM OF DIVERSIONS FROM BEAUGHAN CREEK



SCHEMATIC DIAGRAM OF DIVERSIONS FROM CARRICK CREEK

FIGURE 14e

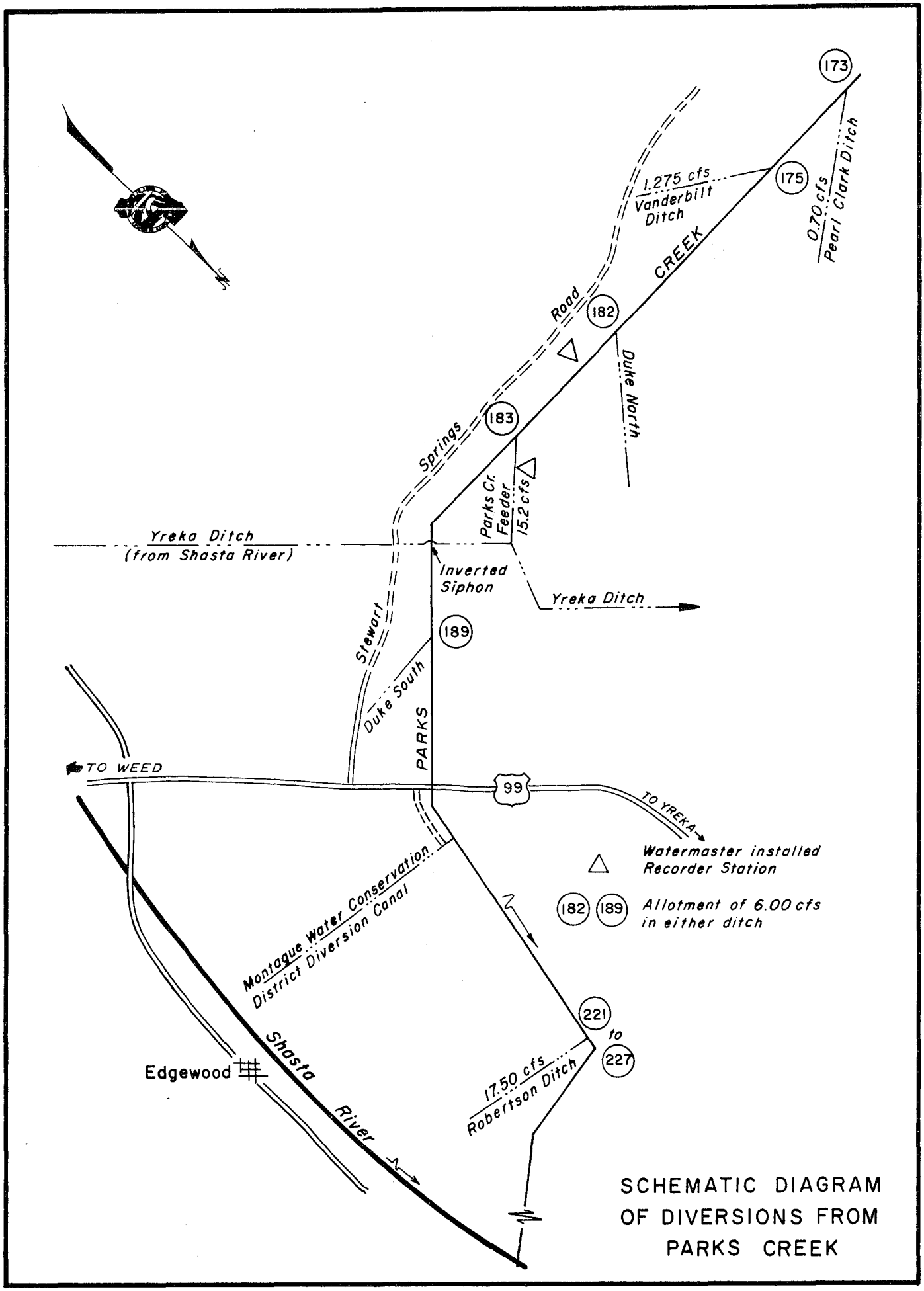
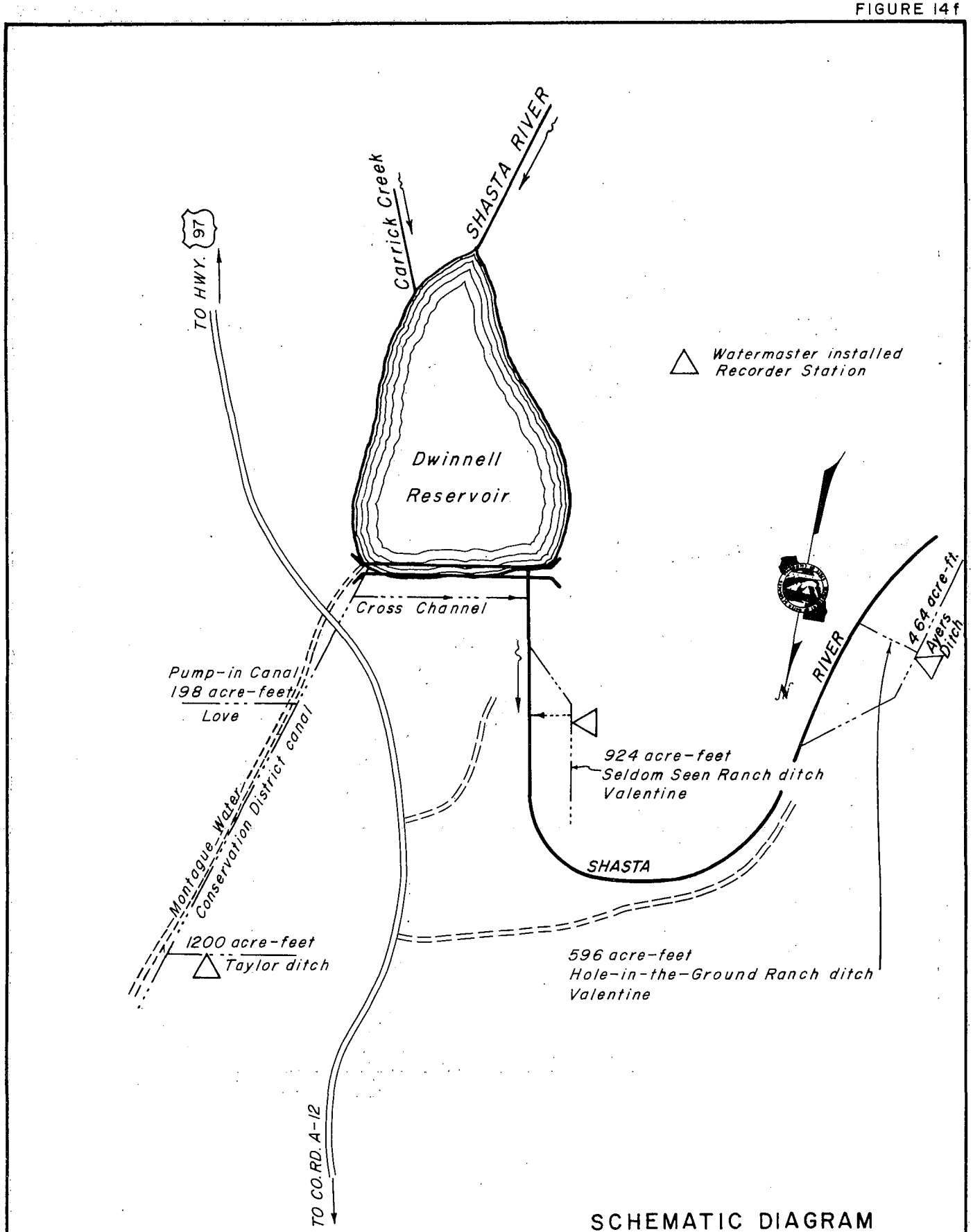
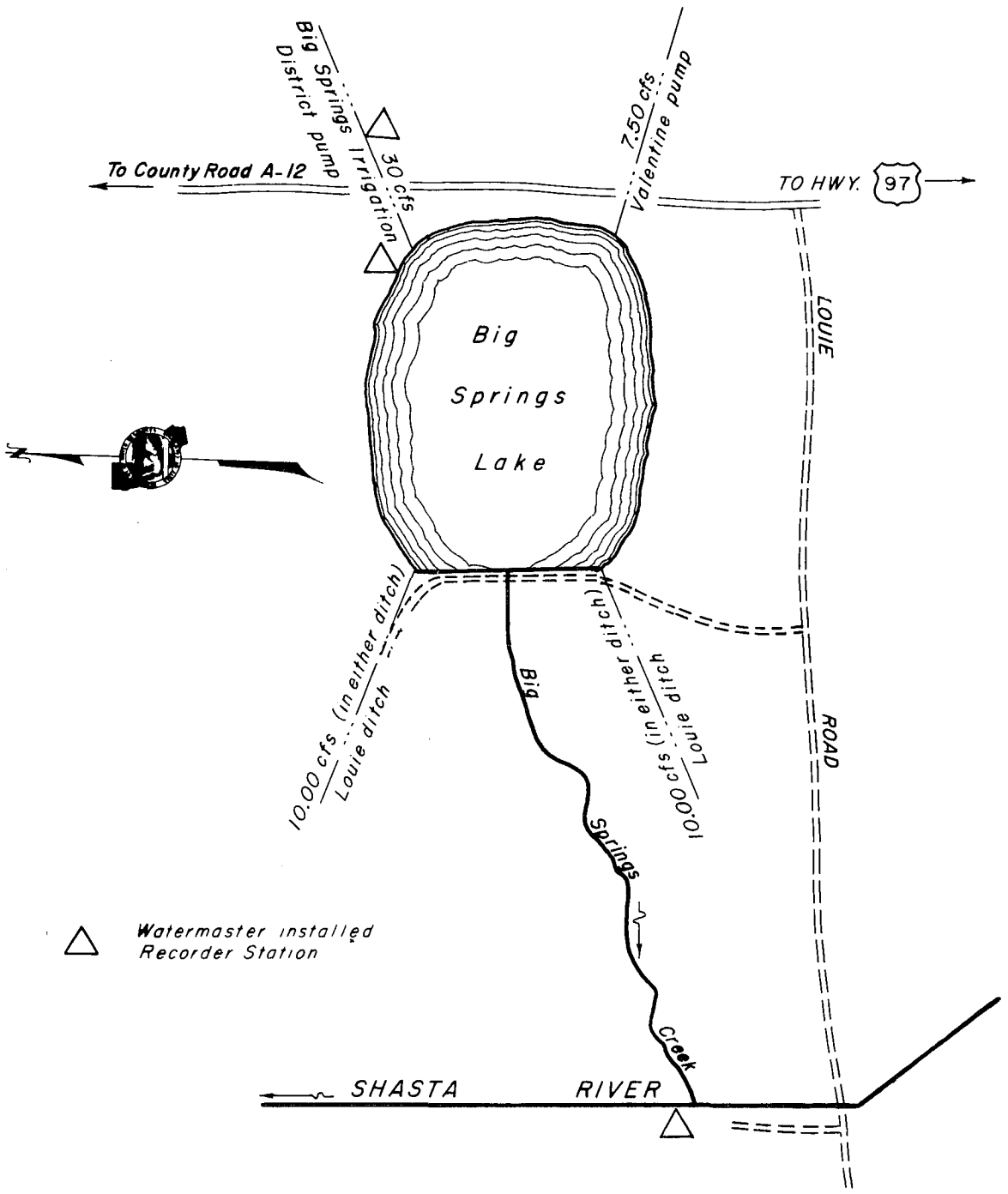

173
175
1,275 cfs
Vanderbilt
Ditch
0.70 cfs
Pearl Clark Ditch
CREEK
Road
182
Duke North
Springs
183
Parks Cr.
Feeder
15.2 cfs
Yreka Ditch
(from Shasta River)
Inverted
Siphon
Yreka Ditch
Stewart
189
Duke South
PARKS
TO WEED
99
TO YREKA
Watermaster installed
Recorder Station
182 189 Allotment of 6.00 cfs
in either ditch
Montague Water Conservation
District Diversion Canal
221
to
227
17.50 cfs
Robertson Ditch
Edgewood
Shasta
River
SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
PARKS CREEK

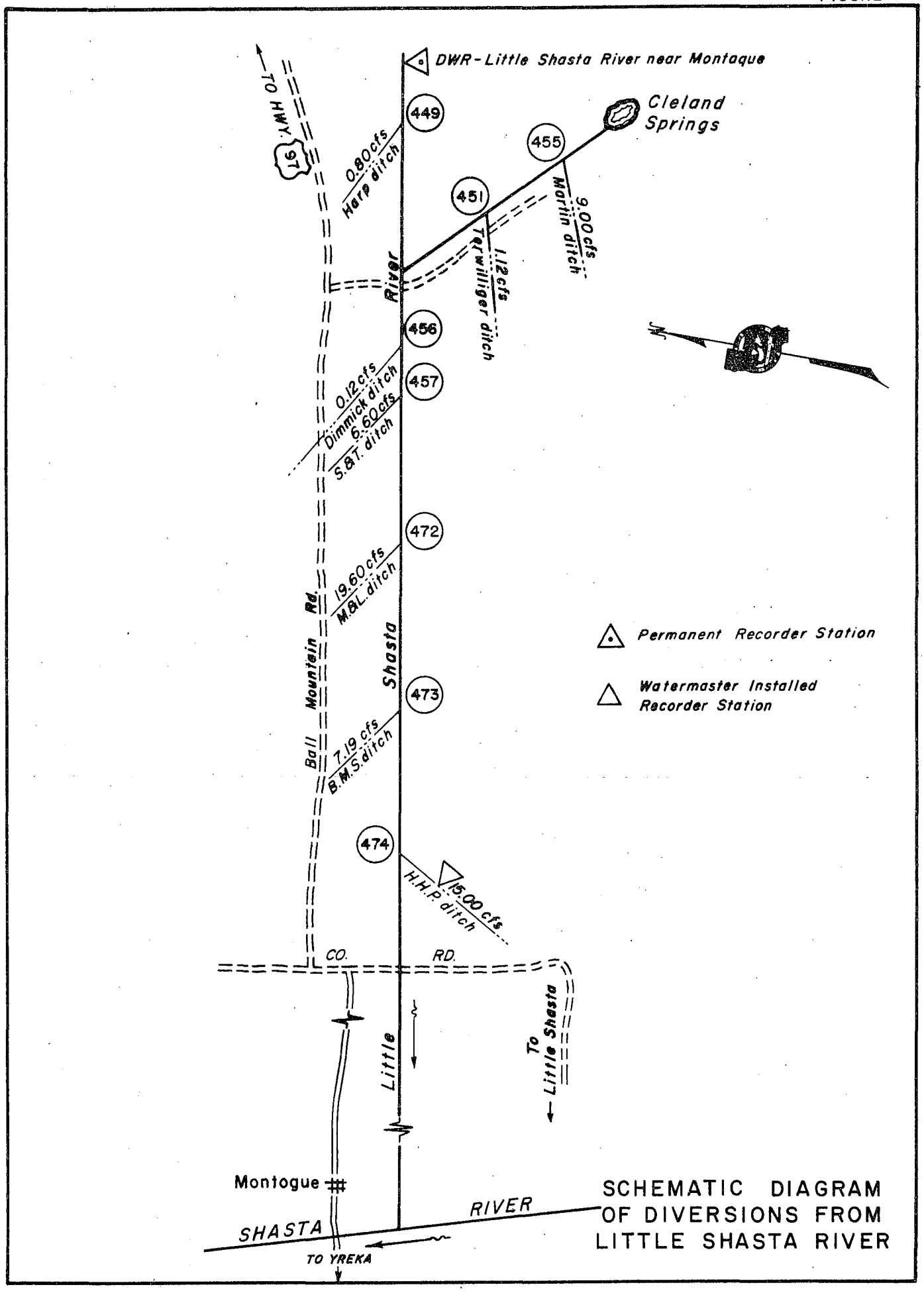
FIGURE 14f



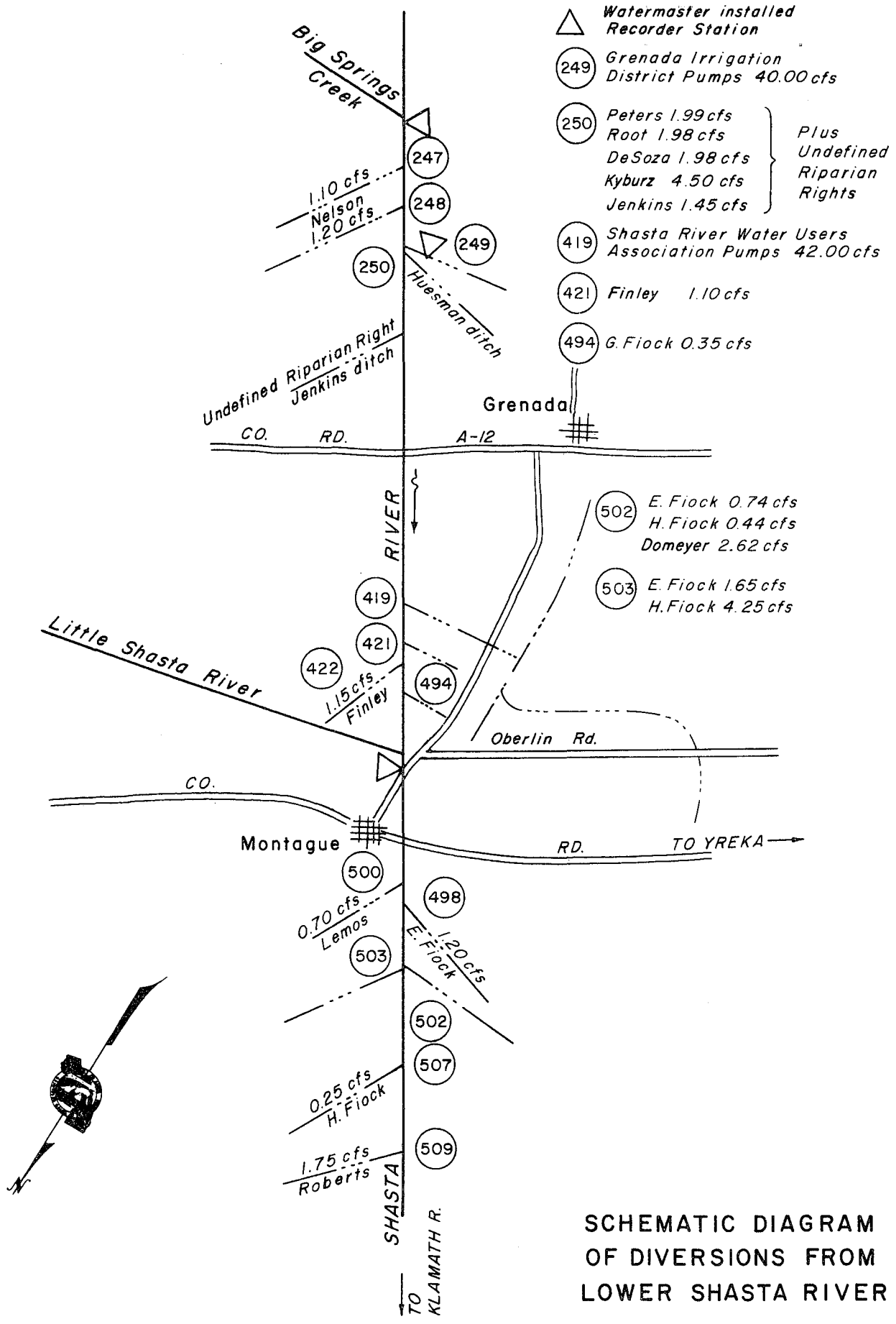
SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
SHASTA RIVER PRIOR RIGHTS
BELOW DWINNELL RESERVOIR



SCHEMATIC DIAGRAM OF DIVERSIONS FROM BIG SPRINGS LAKE



SCHEMATIC DIAGRAM OF DIVERSIONS FROM LITTLE SHASTA RIVER



SCHEMATIC DIAGRAM OF DIVERSIONS FROM LOWER SHASTA RIVER

South Fork Pit River Watermaster Service Area

The South Fork Pit River service area is located primarily in Modoc County with a small portion extending into the northern part of Lassen County. There are 37 water right owners in the area with total allotments of 350.97 cubic feet per second.

Water supply for this service area is obtained from the South Fork Pit River and its tributaries which rise on the western slopes of the Warner Mountains. The river flows in a westerly direction, entering South Fork Valley near Likely. It then flows north through the valley to its confluence with the North Fork Pit River at Alturas. The South Fork Pit River is joined from the east by Fitzhugh Creek near the middle of the valley and by Pine Creek just south of Alturas.

The major area of water use is in South Fork Valley between Likely and Alturas. South Fork Valley is about 16 miles long and 3 miles wide with the valley floor lying at an elevation of about 4,500 feet. The valley is bounded on both sides by a rocky plateau that separates it from the surrounding mountains.

A schematic drawing of each major stream system within the South Fork Pit River service area is presented as Figures 15 through 15d, pages 98 through 102.

Water Supply

The water supply for Pine Creek is derived mostly from snowmelt runoff. Therefore, runoff is usually small in the early spring, increases to a peak in May as temperatures rise, and then gradually decreases throughout the remainder of the season. Water users supplement their irrigation supplies from other sources whenever possible.

The water supply for Fitzhugh Creek consists of snowmelt runoff early in the season and supplemental water diverted from Mill Creek above Jess Valley later in the season. Surplus water from Fitzhugh Creek is diverted into the Payne and French Reservoirs through Payne-French Ditch (Diversion 136) until about June, when the diversion is closed to supply downstream allotments. By July the creek has normally receded until only first priority allotments are available.

Payne Ditch (Diversion 1) is opened to import water from Mill Creek to Fitzhugh Creek when the snow has melted enough to allow access. This imported water is rediverted from North Fork Fitzhugh Creek through the Bowman Ditch to the Bowman Ranch. Return flow from Bowman Ranch to the creek is rediverted through diversion 136 for stockwatering purposes in the Payne-French Ditch.

The water supply for the South Fork Pit River is derived primarily from snowmelt runoff, supplemented by water released from West Valley Reservoir. A number of streams, which rise at high elevations, collect at the mouth of Jess Valley to form the South Fork Pit River. West Valley Reservoir is located on West Valley Creek which enters the river below Jess Valley.

Most of the water users on the South Fork Pit River, except those in Jess Valley, are in the South Fork Irrigation District. The district stores water in West Valley Reservoir, which has a capacity of 22,240 acre-feet, and releases it to the South Fork Pit River as a supplemental supply when the natural flow becomes insufficient to meet demands. This usually occurs during the middle of June. Reservoir releases, together with the natural flow, are distributed by the watermaster in cooperation with the Board of Directors of the irrigation district. Except for extremely dry

years, natural flow, combined with stored water, is sufficient to supply all demands for water on the South Fork Pit River throughout the irrigation season.

Records of the daily mean discharge of the several stream gaging stations in the area are presented in Tables 37 through 40, page 97.

Methods of Distribution

Irrigation of the lands along tributary streams is accomplished by flooding through use of small lateral ditches. The water is distributed on a continuous-flow basis to each user through gravity-flow diversion systems. In some cases, rotation is practiced among several users.

Most irrigation in the South Fork Pit River area is by the check and border method. The lands receive water essentially on demand by supplementing natural flow with releases from West Valley Reservoir. However, irrigation between the various ranches must be coordinated to eliminate large peak demands from the reservoir and to use the return flow as much as possible. Actual distribution varies each year as there is no specific irrigation schedule in use.

The South Fork Pit River decree and the Pine Creek Agreement (see Table 1) establish a two-priority class system of distribution for the Fitzhugh Creek and Pine Creek stream systems. Distribution to the South Fork Pit River users (the decree provides for a two-priority class system) is carried out on an equal and correlative basis in accordance with the water requirements for each ranch. This method of operation was made possible by construction of West Valley Reservoir in 1937.

1968 Distribution

Watermaster service began April 1 in the South Fork Pit River service area and continued until September 30. George H. Pape, Associate Engineer, Water Resources, was watermaster during this period.

The water supply for the 1968 irrigation season was far below average. A very light snowpack and little spring rain resulted in severe water shortages in parts of the service area.

Pine Creek. Close regulation was required throughout the irrigation season. On April 1, Pine Creek was flowing at 75 percent of first priority allotments. Flows gradually increased throughout May and reached a peak of 50 percent of second priority in early June. Following haying, there was insufficient water to irrigate all the irrigable lands. The creek dropped to 50 percent of first priority in early August and, except for a heavy rainstorm in mid-August, remained fairly constant for the remainder of the irrigation season.

Fitzhugh Creek. Regulation began in late April when the Yankee Jim ditch was opened. The Bowman and Payne ditches were opened in May. The full first priority allotment to the Payne ditch from Mill Creek was available all season. The flow in North Fork Fitzhugh Creek, however, satisfied only a portion of first priority rights to the Yankee Jim and Bowman ditches. The flow at the lower recorder above the Bell Ranch satisfied a portion of second priority rights for only a short time in May.

South Fork Pit River. The natural flow of the South Fork Pit River was inadequate to supply demands during most of the irrigation season. Water was released from West Valley Reservoir for a short period in April and from May 20 until the end of September.

The maximum storage in the reservoir was 20,400 acre-feet on May 20. At the end of September, 3,000 acre-feet remained in storage.

TABLE 37
DAILY MEAN DISCHARGE
SOUTH FORK PIT RIVER NEAR LIKELY
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	57	30	122	69	87	129	34
2	37	34	126	93	85	129	34
3	20	29	130	99	84	129	34
4	18	24	130	118	83	127	31
5	18	23	134	154	81	124	34
6	16	45	124	137	85	121	34
7	15	63	122	96	87	121	36
8	14	66	119	109	83	119	34
9	15	66	116	96	79	119	32
10	36	82	110	88	79	118	37
11	36	110	113	85	78	115	70
12	20	139	121	82	75	115	69
13	12	126	116	82	73	116	66
14	12	126	84	77	75	126	66
15	11	139	69	67	75	127	63
16	10	132	56	72	72	130	63
17	11	116	64	103	73	137	62
18	15	110	88	118	75	132	62
19	12	115	82	118	73	139	64
20	14	108	102	113	72	136	66
21	13	105	115	110	90	76	70
22	13	99	137	139	134	79	67
23	9.9	106	121	166	130	61	69
24	9.0	106	87	166	130	50	70
25	12	101	61	124	132	47	70
26	12	97	53	88	132	46	69
27	10	97	66	84	129	43	67
28	10	93	72	87	127	42	65
29	10	106	75	88	127	42	64
30	14	113	75	88	148	37	64
31	17		62		150	35	
Mean	17.1	90.2	98.5	104	96.9	98.9	55.5
Runoff in acre-feet	1050	5370	6050	6180	5960	6080	3300

TABLE 38
DAILY MEAN DISCHARGE
WEST VALLEY CREEK BELOW WEST VALLEY RESERVOIR
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1				24*	74	115	12
2				32	74	115	11
3				32	72	115	11
4				41	72	112	11
5				55	72	112	11
6				38	71	112	11
7				26	70	109	10
8				26	69	109	10
9				26	69	109	10
10				26	69	109	31
11				26	69	107	62
12				26	67	107	60
13				26	67	107	60
14				26	67	106	60
15				26	67	106	59
16				43	67	106	59
17				65	67	106	59
18				76	66	105	59
19				76	66	80	58
20			15*	76	66	60	57
21			29	76	82	15	56
22			29	115	100	15	56
23			19**	143	100	15	55
24				143	100	15	55
25				109	100	15	55
26				75	100	15	55
27				75	100	14	55<
28				75	100	14	
29				74	100	12	
30				74	135	12	
31					121	12	
Mean			23.0	58.3	81.2	73.0	41.0
Runoff in acre-feet			182	3470	5000	4480	2200

* Beginning of Releases
** End of Releases
< End of Record

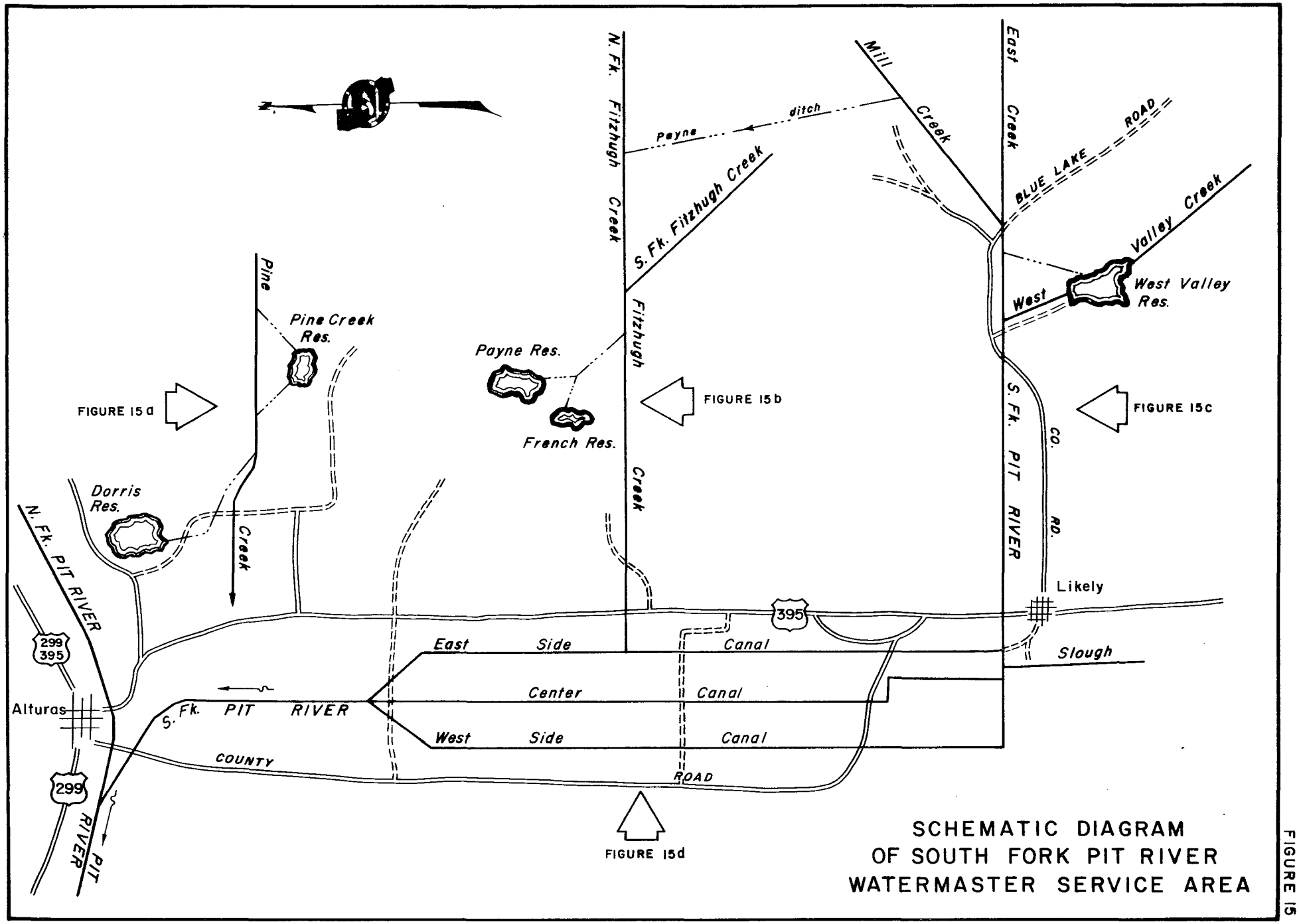
TABLE 39
DAILY MEAN DISCHARGE
FITZHUGH CREEK BELOW DIVERSION NO. 137
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1			7.6*	5.4	1.5		
2			7.6	5.1	1.2		0.6
3			7.2	5.1	1.2		
4			7.2	5.0	1.1		
5			7.2	3.5	0.9		
6			6.4	4.7	0.9		
7			6.3	4.7	1.1	0.4	
8			6.3	4.2	1.1		
9			6.3	3.8	0.8		
10			6.3	3.7	0.8**		
11			7.4	3.4			0.1
12			7.4	3.4			
13			7.4	3.0			0.6
14			7.4	3.0			
15			6.8	3.0	0.7		
16			6.8	2.6		0.5	
17			5.7	2.6			
18			5.7	2.5			0.3
19			5.5	1.9			
20			5.3	1.9			
21			5.3	2.1		0.4	
22			6.2	1.9			
23			6.2	1.8			
24			6.1	1.9	0.8		
25			6.0	1.9			
26			5.6	1.9			
27			5.6	1.5			
28			5.8	1.5			
29			5.7	1.5		0.3	
30			4.9	1.5	0.5		
31			4.9				
Mean			6.3	3.0			
Runoff in acre-feet			389	178			

* Beginning of Record
** End of Record - Intermittent measurements therafter.

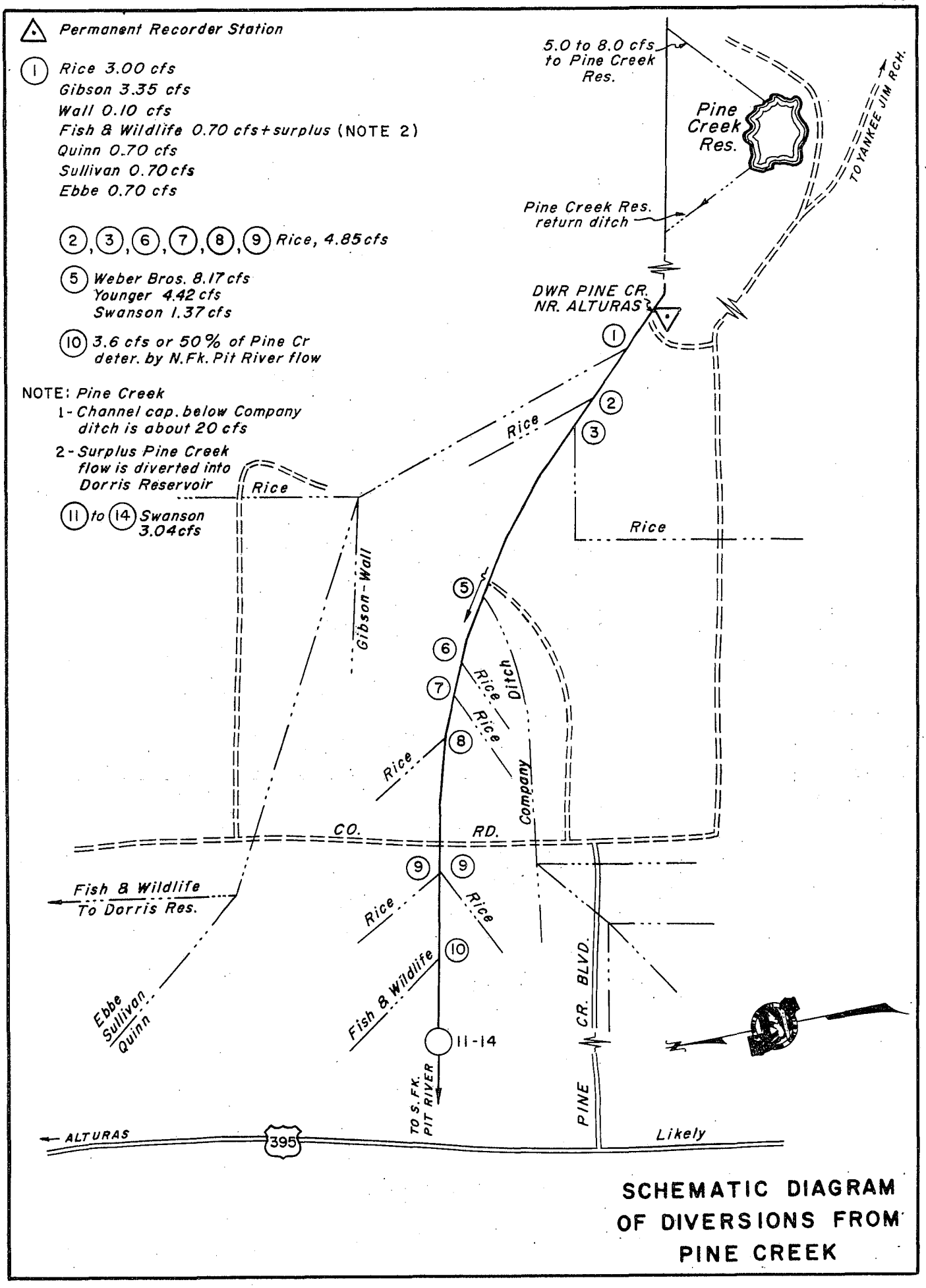
TABLE 40
DAILY MEAN DISCHARGE
PINE CREEK NEAR ALTURAS
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	14	15	22	31	20	12	8.9
2	14	16	22	32	20	12	9.0
3	13	14	22	34	19	12	9.0
4	13	14	22	35	18	11	9.0
5	14	14	22	40	18	12	9.2
6	13	13	22	41	18	11	9.2
7	13	12	24	38	18	11	9.3
8	13	12	27	37	17	10	9.3
9	12	13	28	35	17	10	9.4
10	12	14	28	34	16	10	9.4
11	12	16	29	32	15	10	9.4
12	12	17	29	31	14	9.7	9.4
13	12	16	32	30	14	9.7	9.4
14	12	16	30	29	13	12	9.4
15	12	16	31	28	13	10	9.7
16	12	16	30	28	12	11	9.7
17	13	15	29	27	12	11	9.4
18	13	14	29	27	12	11	9.4
19	13	14	29	26	12	17	9.4
20	13	13	29	26	12	13	9.7
21	13	13	28	26	12	11	9.7
22	13	13	31	26	12	10	9.3
23	13	13	32	26	12	9.4	9.3
24	12	14	32	25	12	9.2	9.3
25	13	15	31	25	12	8.9	9.2
26	12	16	30	24	12	8.9	9.0
27	12	17	30	23	11	8.9	9.0
28	15	18	29	22	11	8.8	8.9
29	14	19	28	22	11	8.8	8.9
30	15	21	28	21	11	8.8	8.9
31	15		29		11	8.9	
Mean	13.0	15.0	27.9	29.4	14.1	10.5	9.3
Runoff in acre-feet	797	891	1710	1750	867	649	552



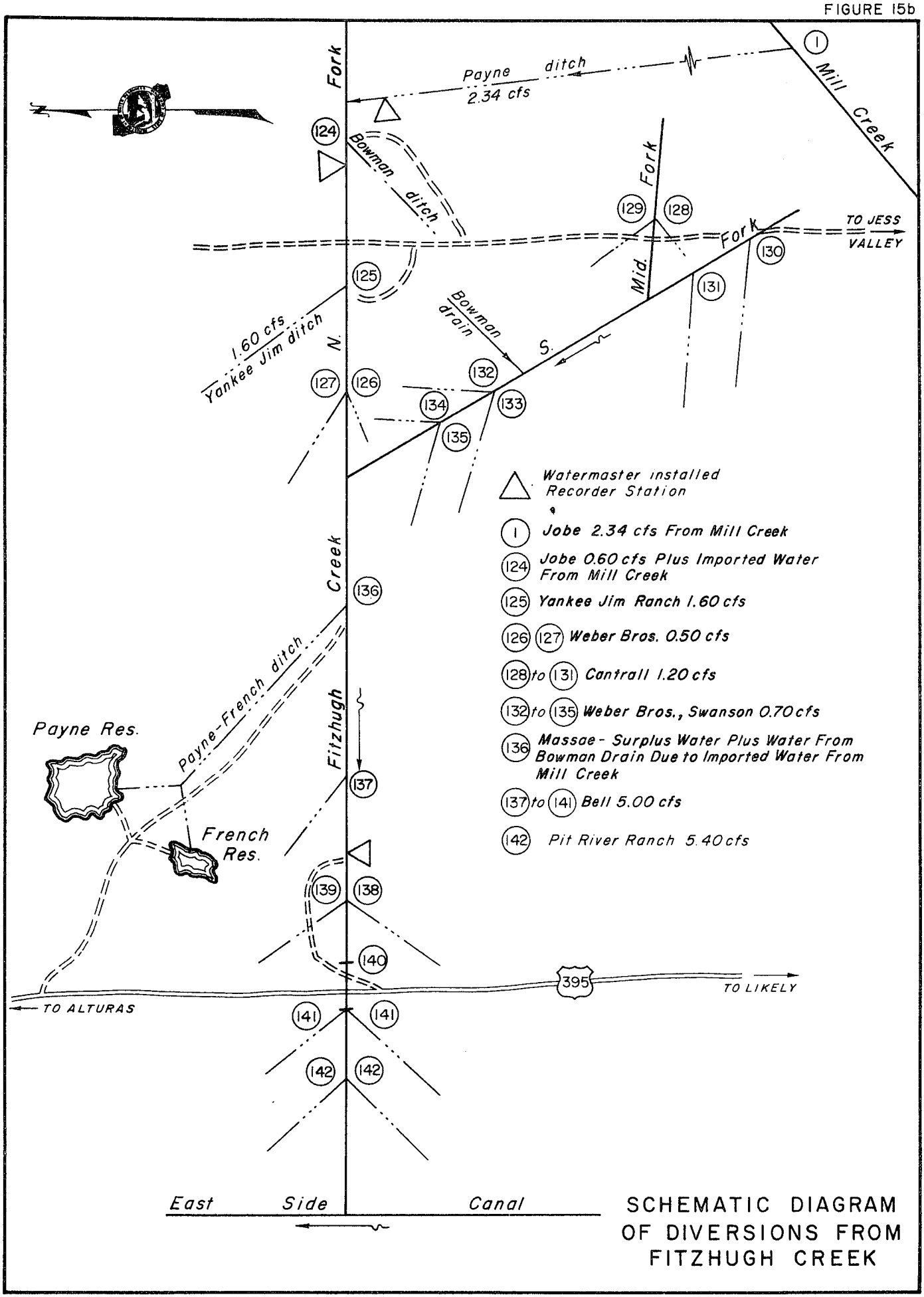
SCHEMATIC DIAGRAM
OF SOUTH FORK PIT RIVER
WATERMASTER SERVICE AREA

FIGURE 15



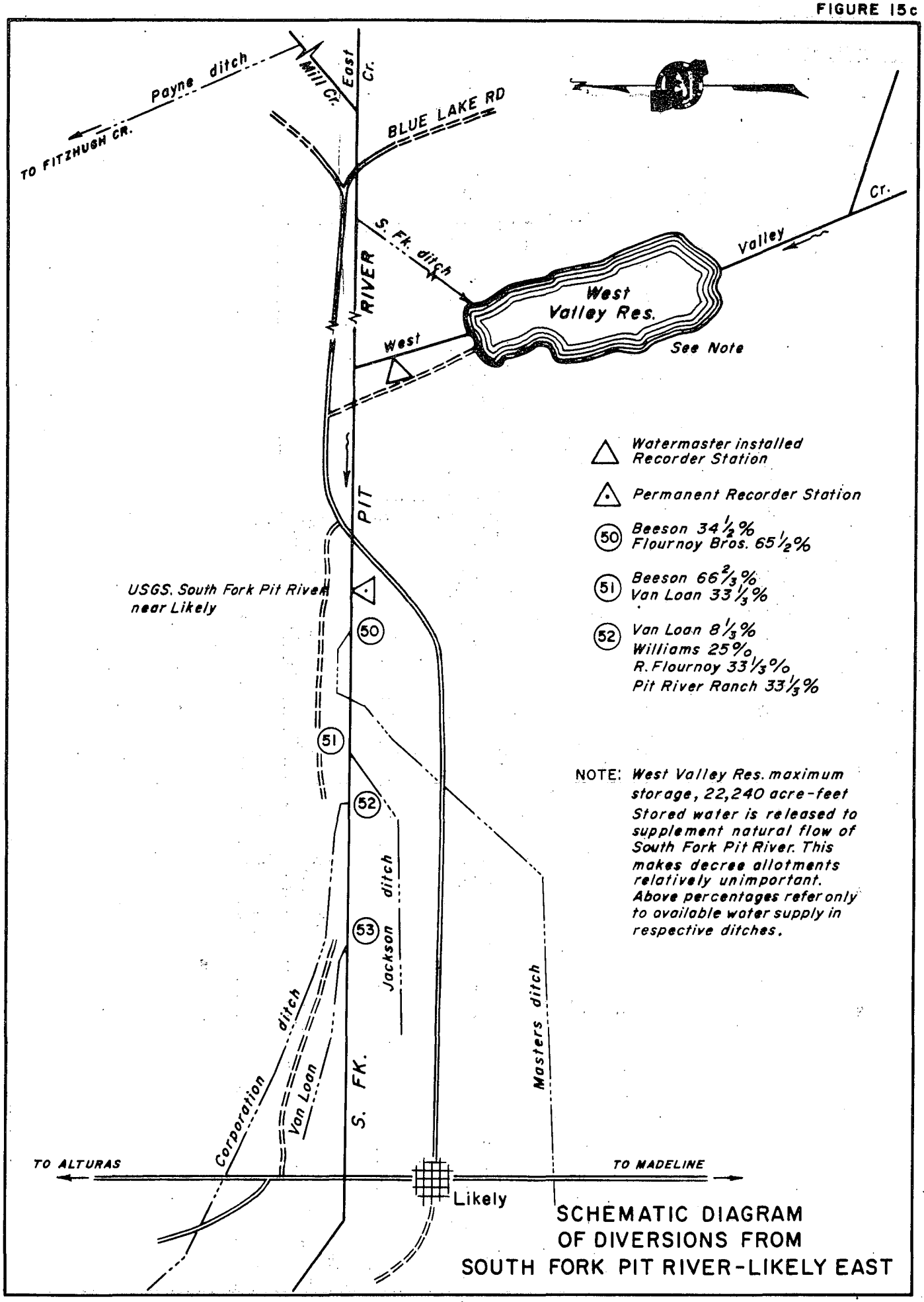
SCHEMATIC DIAGRAM OF DIVERSIONS FROM PINE CREEK

FIGURE 15b

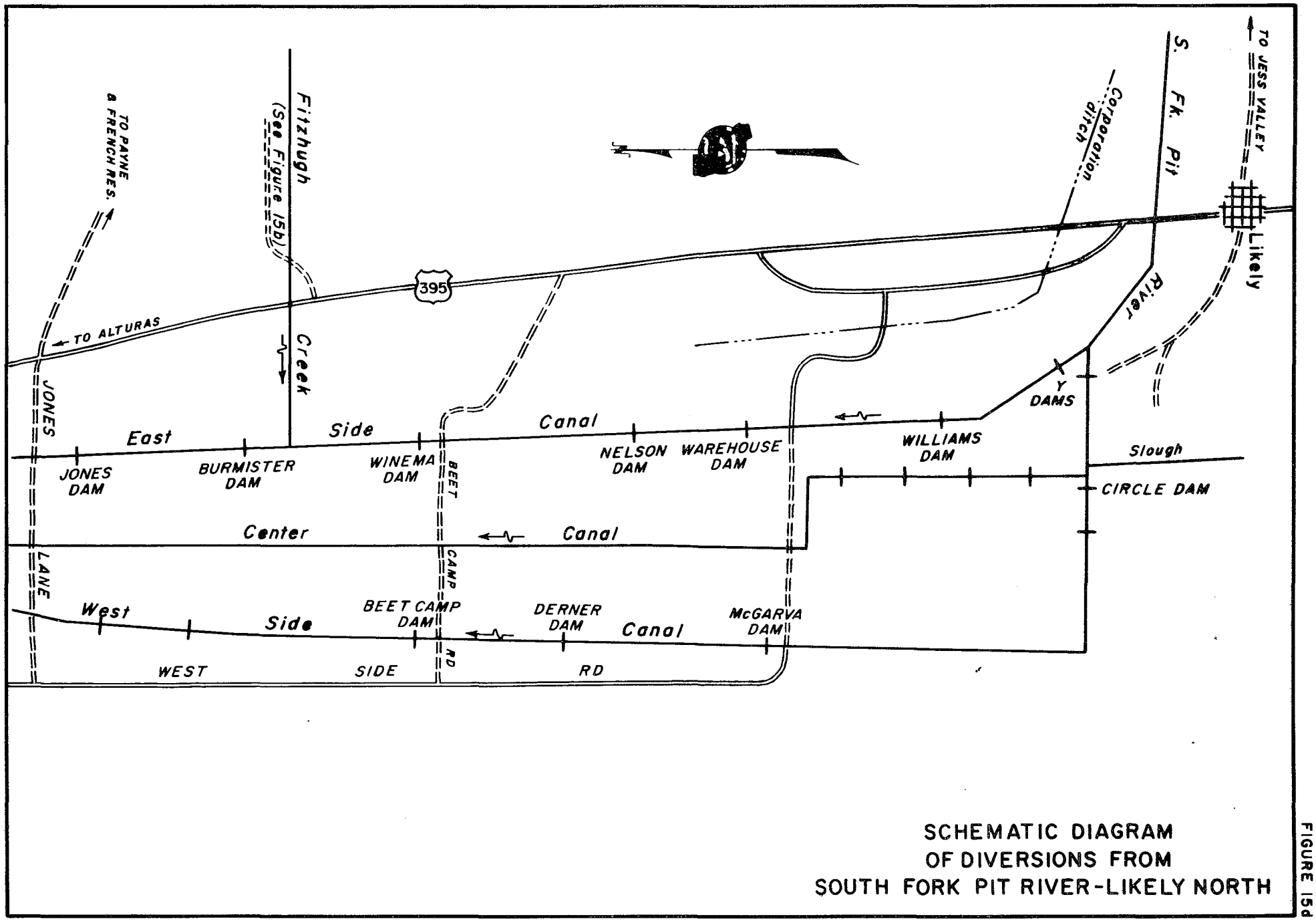


SCHEMATIC DIAGRAM OF DIVERSIONS FROM FITZHUGH CREEK

FIGURE 15c



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
SOUTH FORK PIT RIVER-LIKELY EAST



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
SOUTH FORK PIT RIVER-LIKELY NORTH

FIGURE 15d

Surprise Valley Watermaster Service Area

The Surprise Valley service area is located in the extreme eastern part of Modoc County. There are 172 water right owners in the service area with total allotments of 313.75 cubic feet per second. The source of water supply is comprised of 10 individual stream systems rising on the eastern slope of the Warner Mountains. These streams are fed by snowmelt runoff and traverse a fast, precipitous course down the eastern slope of the Warner Mountains to the valley floor where numerous, scattered diversion ditches convey water to the irrigated lands. The place of use is situated in a long, narrow area extending in a north-south direction between the foot of the Warner Mountains and the Alkali Lakes which lie in the center of Surprise Valley.

Surprise Valley extends from nearly the Oregon border on the north to Lassen County on the south, a distance of approximately 50 miles. The valley varies in width from about 8 to 10 miles. It is bordered on the north, south, and west by the rugged Warner Range and on the east by the typical mountainous desert terrain of Nevada. The valley floor is at an elevation of approximately 4,700 feet.

A schematic drawing of each major stream system within the Surprise Valley service area is presented as Figures 16 through 16j, pages 109 through 120.

Water Supply

The water supply is derived almost entirely from snowmelt runoff, with only minor spring-fed flows occurring in the latter part of the season. There are no known economically justified storage sites on the service area creeks. Because of the lack of regulatory storage, the available water supply at any specific diversion point may vary considerably within a few hours. An extreme differential in day and night temperatures causes extensive variation in snowmelt runoff quantities. This problem is further aggravated by the relatively short and steep drainage area. In addition, occasional summer thunder showers may cause a creek to discharge a flow of mammoth portions for several hours. These flashes are apt to cause considerable damage in washouts and debris deposition and are of such short duration that no beneficial use can be made of the water.

Records of the daily mean discharge at several stream gaging stations within the service area are presented in Tables 41 through 51, pages 104 through 106.

Method of Distribution

The continuous flow method of distribution is employed on most creeks; however, in a few instances the available water supply is rotated among the users in accordance with either decree schedules or by mutual agreements.

Alfalfa and meadow hay, the major crops grown in the valley, are irrigated in most instances by wild flooding. There are also considerable lands dependent upon subsurface irrigation. In addition, recent development of numerous deep wells has popularized sprinkler irrigation. This type of irrigation, however, is limited because of available ground water supply and costs of installation and maintenance.

To facilitate distribution of irrigation waters, construction of permanent diversion dams, headgates, and measuring devices has been stressed during recent years. Although these control devices do not solve the

TABLE 41
DAILY MEAN DISCHARGE
BIDWELL CREEK NEAR FORT BIDWELL

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	21	26	26	25	7.9	3.8	3.4
2	19	23	26	26	7.5	3.8	3.4
3	18	21	26	27	7.1	3.6	3.2
4	18	19	27	26	6.8	3.6	3.2
5	18	19	27	29	6.5	3.2	3.0
6	17	16	24	27	6.3	3.0	2.9
7	16	16	23	25	6.3	3.0	2.9
8	14	16	21	23	6.0	2.9	2.9
9	13	17	21	21	6.0	3.0	2.9
10	17	22	23	19	5.7	2.9	2.9
11	11	26	23	19	5.7	2.9	3.0
12	10	26	23	18	5.7	2.9	3.0
13	11	24	24	18	5.7	3.0	3.0
14	10	24	24	16	5.4	4.3	3.2
15	9.4	23	25	16	5.4	3.4	3.2
16	9.4	23	23	15	5.1	5.1	3.2
17	9.0	21	23	14	4.9	4.3	3.2
18	9.8	20	23	13	4.6	6.8	3.2
19	10	19	26	13	4.1	21	3.0
20	10	18	28	13	4.1	11	3.2
21	9.8	18	29	12	3.9	8.3	3.4
22	9.8	17	28	12	3.9	6.5	3.4
23	9.8	17	27	11	3.9	5.7	3.4
24	10	17	25	11	3.8	4.9	3.2
25	11	17	24	9.8	3.8	4.6	3.0
26	11	18	23	8.7	3.8	4.3	3.0
27	11	18	23	9.4	3.4	4.1	2.9
28	14	19	25	9.0	3.2	3.9	2.9
29	18	22	26	9.0	3.0	3.8	3.0
30	23	25	27	8.7	3.0	3.8	3.0
31	25		26		3.2	3.6	
Mean	13.5	20.2	24.8	16.8	5.0	4.9	3.1
Runoff in acre-feet	829	1200	1520	999	309	300	186

TABLE 42
DAILY MEAN DISCHARGE
MILL CREEK ABOVE ALL DIVERSIONS

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1		9.2*	12	11	4.2	1.9	1.8
2		8.8	12	12	3.9	1.8	1.8
3		8.2	12	12	3.7	1.7	1.8
4		8.0	12	12	3.4	1.7	1.8
5		8.0	12	12	3.2	1.6	1.8
6		7.4	12	13	3.0	1.6	1.8
7		7.2	12	12	2.9	1.6	1.8
8		7.0	12	11	2.8	1.6	1.8
9		7.0	12	11	2.7	1.6	1.8
10		7.4	12	10	2.6	1.6	1.8
11		8.8	12	9.7	2.5	1.6	1.8
12		11	12	9.5	2.4	1.5	1.8
13		11	12	9.0	2.4	1.6	1.8
14		10	12	8.8	2.4	2.3	1.8
15		10	12	8.4	2.3	1.8	1.8
16		10	11	8.2	2.3	2.0	1.8
17		9.5	11	7.8	2.2	1.9	1.8
18		9.0	11	7.6	2.1	2.4	1.8
19		8.4	12	7.4	2.0	8.6	1.8
20		8.2	13	7.2	2.0	4.0	1.8
21		8.0	12	7.0	2.0	2.9	1.8
22		7.4	13	6.8	2.0	2.7	1.8
23		7.0	12	6.5	1.9	2.4	1.8
24		6.8	12	6.0	1.9	2.2	1.8
25		6.8	12	5.4	1.8	2.0	1.7
26		7.6	12	5.2	1.8	2.0	1.7
27		8.4	12	5.0	1.8	2.0	1.7
28		9.0	12	4.8	1.8	2.0	1.7
29		10	12	4.8	1.8	1.9	1.7
30		12	12	4.4	1.8	1.9	1.7
31			12		1.8	1.9	
Mean		8.6	12.0	8.5	2.4	2.2	1.8
Runoff in acre-feet		510	736	507	150	135	106

* Beginning of Record

TABLE 43
DAILY MEAN DISCHARGE
SOLDIER CREEK ABOVE ALL DIVERSIONS

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1		9.8	16	6.2	2.1	2.0	1.8
2		8.0	16	6.2	2.0	1.8	1.7
3		7.6	16	6.0	2.0	1.8	1.7
4		8.0	18	5.7	1.8	1.7	1.7
5		8.0	14	6.6	1.8	1.5	1.7
6		7.1	11	7.6	1.8	1.5	1.7
7		7.1	10	6.4	1.8	1.5	1.7
8		7.1	12	5.7	1.8	1.5	1.8
9		9.0	12	5.2	1.8	1.5	1.8
10		14	12	4.8	1.8	1.5	1.8
11		20	12	4.6	1.8	1.5	1.8
12		14	12	4.4	1.8	1.4	1.7
13		10	12	4.2	1.8	1.4	1.7
14		12	10	4.2	1.7	2.1	1.7
15		11	11	4.0	1.7	1.8	1.7
16		9.0	10	3.8	1.7	2.1	1.7
17		8.0	9.4	3.6	1.7	2.0	1.7
18		7.6	10	3.4	1.7	3.2	1.7
19	4.6*	7.6	11	3.2	1.7	23	1.7
20	4.6	7.1	10	3.2	1.7	6.8	1.7
21	4.8	6.8	9.4	3.0	1.7	6.6	1.5
22	4.6	6.6	9.0	3.0	1.7	6.6	1.5
23	4.6	6.4	9.0	2.8	1.7	5.0	1.5
24	4.8	6.8	8.6	2.7	1.7	3.4	1.5
25	5.5	7.6	8.6	2.5	1.7	3.0	1.5
26	5.3	9.4	8.0	2.4	1.7	2.5	1.5
27	5.5	9.4	8.0	2.4	1.7	2.5	1.5
28	7.6	12	7.6	2.2	1.7	2.4	1.5
29	10	14	7.4	2.2	1.7	2.2	1.5
30	12	16	6.6	2.2	1.8	2.0	1.5
31	12		6.4		1.8	1.8	
Mean	6.6	9.6	10.7	4.1	1.8	3.2	1.6
Runoff in acre-feet	170	569	661	247	109	198	98

* Beginning of Record

TABLE 44
DAILY MEAN DISCHARGE
PINE CREEK AT DIVISION OF NORTH AND SOUTH CHANNELS

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1		8.3	3.5	1.5			
2		7.0	3.5	1.5			
3		6.8	2.9	1.5			
4		6.4	4.2	1.5			
5		6.6	4.2	1.5			
6		5.2	3.5	1.5			
7		4.5	3.2	1.4			
8		4.5	2.9	1.4			
9		5.7	2.8	1.3			
10		8.1	2.8	1.2			
11		11	2.8	1.1			
12		6.8	2.6	1.0			
13		5.2	3.3	0.9			
14		5.4	3.8	0.8			
15		5.0	3.8	0.7			
16		4.1	3.1	0.6			
17		3.1	2.6	0.5			
18		2.9	2.4	0.4		0.5<	
19		2.8	2.4	0.3		8.0	
20	2.0*	2.6	2.3	0.2		0.8	
21	2.6	2.2	2.1	0.1		0.7	
22	2.5	2.0	2.3	0.0**		0.5	
23	2.4	2.0	2.5			0.3	
24	3.1	2.2	2.4			0.1	
25	3.8	2.3	2.3			0.0**	
26	3.3	2.6	2.1				
27	5.7	3.1	1.8				
28	7.2	3.5	1.6				
29	8.7	3.6	1.5				
30	10	3.6	1.5				
31	11		1.5				
Mean	5.2	4.6	2.7	1.0	0	1.6	0
Runoff in acre-feet	124	276	167	41	0	22	0

* Beginning of Record
** End of Flow
< Resumption of Flow

SURPRISE VALLEY WMSA

TABLE 45
DAILY MEAN DISCHARGE
CEDAR CREEK AT CEDARVILLE

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	14	13	9.0	4.2	0.8	0.6	0.4
2	12	14	8.4	4.0	0.8	0.4	0.4
3	12	13	8.4	4.0	0.7	0.2	0.4
4	12	13	8.7	3.6	0.6	0.1	0.3
5	12	13	8.4	4.4	0.7	0.1	0.3
6	10	12	8.1	4.4	0.6	0.1	0.2
7	9.3	12	7.8	3.6	0.6	0.1	0.2
8	8.4	12	7.6	3.3	0.5	0.1	0.2
9	7.8	14	7.3	3.0	0.4	0.1	0.2
10	7.6	15	7.3	2.7	0.4	0.1	0.2
11	7.0	17	7.3	2.6	0.4	0.1	0.2
12	6.7	15	7.3	2.3	0.4	0.1	0.2
13	6.5	13	7.6	2.1	0.4	0.1	0.2
14	6.2	13	7.6	2.0	0.4	0.4	0.2
15	5.9	13	7.6	1.9	0.4	0.4	0.3
16	6.2	12	7.3	1.8	0.4	0.7	0.3
17	5.9	11	6.7	1.7	0.4	0.5	0.2
18	6.2	9.9	6.5	1.6	0.4	1.0	0.2
19	6.2	10	7.0	1.4	0.4	6.2	0.2
20	6.2	10	6.7	1.4	0.3	2.1	0.3
21	6.2	9.9	6.5	1.3	0.3	1.6	0.3
22	6.5	9.6	6.7	1.2	0.2	2.1	0.3
23	6.5	9.6	7.0	1.2	0.2	1.3	0.3
24	6.7	9.0	6.7	1.1	0.2	0.8	0.3
25	7.8	9.0	6.5	1.1	0.2	0.6	0.2
26	7.6	9.0	5.9	0.9	0.1	0.6	0.2
27	7.8	9.0	5.6	0.9	0.1	0.5	0.2
28	8.4	9.0	5.6	1.0	0.1	0.5	0.2
29	10	9.0	5.4	1.0	0.1	0.4	0.2
30	9.9	9.0	4.8	1.0	0.1	0.4	0.2
31	11		4.6		0.1	0.4	
Mean	7.9	11.6	7.0	2.2	0.4	0.7	0.2
Runoff in acre-feet	487	688	432	132	23	45	15

SURPRISE VALLEY WMSA

TABLE 46
DAILY MEAN DISCHARGE
NORTH DEEP CREEK ABOVE ALL DIVERSIONS

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1		2.6*	3.3	1.3	0.6	0.5	0.7
2		2.9	4.8	1.3	0.6	0.4	0.7
3		2.6	4.3	1.3	0.5	0.3	0.6
4		2.4	4.3	1.3	0.5	0.3	0.6
5		2.9	3.7	1.5	0.5	0.2	0.6
6		2.6	2.6	1.3	0.5	0.2	0.6
7		2.6	2.2	1.3	0.4	0.2	0.6
8		2.4	2.0	1.2	0.4	0.3	0.6
9		2.4	2.0	1.1	0.4	0.3	0.6
10		2.6	1.8	1.0	0.4	0.3	0.6
11		3.7	1.8	0.9	0.4	0.3	0.6
12		4.8	1.7	0.9	0.4	0.3	0.6
13		3.7	2.0	0.8	0.4	0.3	0.6
14		3.3	1.7	0.8	0.4	0.6	0.6
15		2.6	1.7	0.8	0.4	0.5	0.6
16		2.2	1.7	0.8	0.4	0.6	0.6
17		2.2	1.6	0.8	0.4	0.6	0.6
18		2.2	1.5	0.8	0.4	0.8	0.6
19		2.2	1.6	0.7	0.3	3.3	0.5
20		2.0	1.6	0.7	0.3	1.4	0.5
21		2.0	1.6	0.7	0.3	1.3	0.5
22		1.8	1.7	0.7	0.3	1.5	0.5
23		1.7	1.8	0.7	0.3	1.1	0.5
24		1.7	1.7	0.7	0.3	1.0	0.5
25		1.7	1.7	0.6	0.3	0.9	0.5
26		1.7	1.6	0.6	0.3	0.9	0.5
27		1.8	1.5	0.6	0.3	0.8	0.4
28		2.2	1.5	0.6	0.3	0.8	0.4
29		2.6	1.5	0.6	0.3	0.8	0.3
30		3.3	1.4	0.6	0.3	0.8	0.3
31			1.4		0.3	0.7	
Mean		2.5	2.1	0.9	0.4	0.7	0.5
Runoff in acre-feet		150	129	54	24	44	32

* Beginning of Record

SURPRISE VALLEY WMSA

TABLE 47
DAILY MEAN DISCHARGE
SOUTH DEEP CREEK ABOVE ALL DIVERSIONS

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1		6.3*	6.3	2.8	0.8	0.6	0.6
2		6.0	6.3	2.6	0.7	0.5	0.6
3		5.8	6.0	2.6	0.7	0.3	0.6
4		5.8	6.0	2.6	0.6	0.3	0.6
5		6.0	5.8	3.2	0.6	0.3	0.5
6		5.8	5.3	2.9	0.6	0.3	0.4
7		5.3	5.1	2.8	0.6	0.3	0.4
8		5.3	5.1	2.6	0.5	0.3	0.4
9		5.6	4.8	2.4	0.5	0.3	0.4
10		6.3	4.6	2.2	0.5	0.3	0.4
11		7.2	4.6	2.1	0.5	0.3	0.4
12		7.4	4.3	2.1	0.5	0.3	0.3
13		6.7	4.8	1.9	0.4	0.4	0.3
14		6.7	4.8	1.8	0.4	0.7	0.3
15		6.3	4.8	1.7	0.4	0.6	0.3
16		6.0	4.6	1.5	0.4	0.7	0.3
17		5.3	4.1	1.4	0.4	0.6	0.3
18		5.3	3.8	1.3	0.4	0.8	0.3
19		5.1	3.8	1.2	0.4	5.1	0.4
20		4.6	3.6	1.2	0.3	1.8	0.4
21		4.1	3.6	1.2	0.3	2.2	0.4
22		3.8	3.8	1.1	0.3	2.1	0.4
23		3.6	4.1	1.0	0.3	1.3	0.4
24		3.8	3.8	0.9	0.3	1.0	0.4
25		4.1	3.8	0.9	0.3	0.9	0.4
26		4.3	3.4	0.9	0.3	0.8	0.4
27		4.6	3.4	0.9	0.3	0.7	0.4
28		4.8	3.2	0.9	0.3	0.7	0.3
29		5.3	2.9	0.9	0.3	0.7	0.3
30		5.8	2.9	0.8	0.3	0.7	0.3
31			2.8		0.3	0.6	
Mean		5.4	4.4	1.7	0.4	0.9	0.4
Runoff in acre-feet		323	270	104	27	52	24

* Beginning of Record

SURPRISE VALLEY WMSA

TABLE 48
DAILY MEAN DISCHARGE
OWL CREEK BELOW ALLEN-ARRECHE DITCH

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1		12*	20	31	9.2	3.5	4.4
2		9.7	22	36	8.5	3.0	4.2
3		8.8	22	38	7.9	2.8	4.2
4		8.4	24	34	7.7	2.8	3.7
5		8.7	22	31	7.4	2.7	3.8
6		8.2	19	28	7.2	2.9	3.7
7		7.6	20	23	7.0	2.8	3.6
8		7.8	20	22	6.5	3.5	3.6
9		9.5	22	20	6.2	3.4	3.5
10		13	25	20	5.8	2.8	3.4
11		17	23	20	5.5	2.6	3.3
12		15	24	22	5.3	2.6	3.3
13		12	25	21	5.2	2.6	3.2
14		13	22	20	5.1	5.0	3.2
15		12	20	20	4.8	3.8	3.2
16		11	19	21	4.6	4.7	3.2
17		9.8	19	22	4.4	4.3	3.0
18		9.5	22	22	4.2	8.4	2.9
19		9.2	25	22	4.1	29	3.0
20		8.8	31	22	4.0	22	3.2
21		8.4	28	20	3.9	11	3.2
22		7.9	27	19	3.8	10	3.0
23		7.8	24	18	3.7	8.2	2.9
24		8.0	22	16	3.6	7.0	2.9
25		8.7	20	14	3.5	6.4	2.8
26		9.7	21	13	3.4	6.0	2.8
27		10	23	13	3.3	5.5	2.7
28		12	26	12	3.0	5.3	2.7
29		16	29	11	3.0	5.2	2.7
30		19	29	10	3.0	4.8	2.6
31			28		3.0	4.6	
Mean		10.6	23.3	21.4	5.1	6.1	3.3
Runoff in acre-feet		632	1430	1270	313	375	194

* Beginning of Record

TABLE 49
DAILY MEAN DISCHARGE
RADER CREEK ABOVE ALL DIVERSIONS
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1		4.1*	8.3	16	4.5	1.1	2.1
2		3.8	8.7	17	4.2	0.9	2.0
3		3.4	8.7	17	4.0	0.9	1.9
4		3.4	10	16	3.8	0.8	1.8
5		3.3	9.7	16	3.7	0.7	1.7
6		3.1	8.5	13	3.6	0.7	1.6
7		3.1	8.3	11	3.2	0.7	1.5
8		3.2	8.5	11	3.0	0.7	1.5
9		3.7	9.2	11	2.8	0.7	1.4
10		4.6	10	10	2.6	0.7	1.4
11		6.0	11	10	2.5	0.7	1.4
12		5.8	11	10	2.4	0.7	1.3
13		5.1	10	10	2.3	0.7	1.3
14		5.1	9.2	10	2.1	1.4	1.2
15		5.1	8.3	10	2.0	0.9	1.2
16		4.8	8.0	10	1.9	1.0	1.2
17		4.6	8.0	11	1.8	0.9	1.1
18		4.4	9.0	11	1.7	1.5	1.0
19		4.2	11	11	1.6	11	1.0
20		4.1	15	11	1.5	5.3	1.0
21		4.0	13	10	1.4	3.7	1.0
22		3.8	12	9.7	1.4	3.4	0.9
23		3.8	10	9.0	1.4	3.2	0.9
24		3.8	9.7	8.0	1.2	2.9	0.9
25		3.8	9.7	7.4	1.1	2.8	0.9
26		4.2	10	6.6	1.0	2.7	0.9
27		4.4	11	6.2	1.0	2.6	0.9
28		4.8	12	5.9	1.0	2.6	0.9
29		6.8	14	5.6	0.9	2.5	0.9
30		7.4	15	4.8	0.9	2.4	0.9
31			15		0.9	2.2	
Mean		4.4	10.4	10.5	2.2	2.0	1.3
Runoff in acre-feet		261	638	625	134	125	75

* Beginning of Record

TABLE 50
DAILY MEAN DISCHARGE
EAGLE CREEK AT EAGLEVILLE
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	6.8	4.8	13	22	5.2	2.8	4.2
2	6.2	4.2	15	22	4.8	2.6	4.5
3	5.9	4.5	16	20	4.8	2.4	4.5
4	5.8	4.2	17	18	4.8	2.0	4.2
5	5.8	4.5	15	17	4.8	2.0	4.2
6	5.4	4.2	12	16	4.8	2.0	3.8
7	5.0	4.5	11	15	4.8	2.0	3.6
8	4.6	4.8	11	14	4.5	2.0	3.8
9	4.3	5.2	14	15	4.5	2.0	3.6
10	3.9	5.5	15	18	4.2	2.0	3.4
11	3.6	8.2	16	14	4.2	2.0	3.0
12	3.8	10	15	14	4.2	2.0	3.0
13	3.5	9.7	13	15	4.2	2.1	2.8
14	3.3	8.2	11	16	4.2	3.5	2.8
15	3.1	7.7	11	15	4.2	2.6	2.6
16	3.0	6.6	11	17	4.2	2.6	2.6
17	3.2	7.7	12	19	4.2	2.6	2.4
18	2.8	7.2	14	21	4.2	3.6	2.4
19	3.6	6.0	18	21	3.8	23	2.5
20	4.5	5.2	20	20	3.6	17	2.5
21	3.0	4.8	16	18	3.6	9.7	2.5
22	2.5	4.8	17	16	3.6	8.2	2.5
23	2.4	4.8	14	15	3.4	7.7	2.4
24	2.6	4.8	13	12	3.4	7.7	2.3
25	3.0	5.2	12	9.7	3.4	7.7	2.1
26	3.6	5.5	12	9.0	3.0	6.0	2.0
27	3.0	6.0	13	8.2	3.0	6.0	2.0
28	3.6	7.2	13	7.7	2.8	5.5	2.0
29	4.8	9.7	10	7.2	2.6	4.8	2.0
30	4.2	12	24	5.5	2.6	4.5	2.0
31	4.2		24		2.6	4.5	
Mean	4.0	6.3	14.4	15.2	3.9	5.0	2.9
Runoff in acre-feet	247	372	889	907	242	308	175

TABLE 51
DAILY MEAN DISCHARGE
EMERSON CREEK ABOVE ALL DIVERSIONS
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1		6.0*	7.4	8.5	3.0	2.0	3.5
2		6.0	7.4	8.8	2.8	1.8	3.5
3		5.3	7.4	9.1	2.7	1.8	3.5
4		5.0	8.2	8.8	2.7	1.7	3.5
5		5.0	8.0	9.4	2.6	1.7	3.5
6		4.7	7.7	8.8	2.6	1.7	3.5
7		4.4	7.4	8.2	2.5	1.7	3.4
8		4.4	7.4	7.7	2.4	1.7	3.4
9		5.3	8.0	7.4	2.3	1.7	3.4
10		6.0	8.2	6.8	2.3	1.7	3.4
11		9.0	8.2	6.4	2.3	1.7	3.4
12		8.0	8.2	6.1	2.2	1.7	3.4
13		6.5	8.8	5.8	2.2	1.8	3.4
14		6.5	8.5	5.8	2.0	2.2	3.5
15		6.5	8.2	5.3	2.0	2.0	3.5
16		6.0	7.7	5.0	2.0	2.4	3.5
17		5.6	7.4	4.7	2.0	2.2	3.4
18		6.5	7.7	4.7	2.0	2.7	3.4
19		5.3	8.0	4.4	2.0	12	3.5
20		5.0	8.8	4.2	2.0	8.5	3.4
21		5.0	8.5	4.0	2.0	6.5	3.5
22		4.7	9.1	3.7	2.0	5.6	3.4
23		4.4	8.8	3.7	1.9	4.7	3.4
24		4.7	8.5	3.5	1.8	4.4	3.4
25		4.7	8.5	3.4	1.8	4.2	3.4
26		5.0	8.2	3.2	1.8	4.0	3.2
27		5.0	8.2	3.2	1.8	3.7	2.8
28		5.3	8.2	3.2	1.8	3.7	2.8
29		6.1	8.5	3.4	1.8	3.7	2.7
30		7.0	8.8	3.2	1.8	3.7	2.7
31			8.8		1.8	3.5	
Mean		5.6	8.2	5.7	2.2	3.3	3.3
Runoff in acre-feet		335	501	338	133	203	199

* Beginning of Record

problems of discharge variation and debris deposition, they do provide significant assistance in solving water measurement and distribution problems.

The several decrees (see Table 1) which apply to the Surprise Valley service area establish the following number of priority classes for the various stream systems: Bidwell Creek - four until July 10, five thereafter; Mill Creek - four; Soldier Creek - rotation March 19 to June 19 (upper users eight, lower users seven), twelve priorities are in effect during the remainder of the year; Pine Creek - a rotation schedule based on accumulative flow in acre-feet is used; Cedar Creek - four; Deep Creek - five; Owl Creek - twenty-one; Rader Creek - six; Eagle Creek - four; and Emerson Creek - four.

1968 Distribution

Watermaster service began in the Surprise Valley service area on March 19 and continued until September 30. Lester Lighthall, Water Resources Technician II, was watermaster during this period.

The 1968 season produced far below average runoff during the irrigation season throughout the valley. The below normal snowpack on the east slope of the Warner Mountains, combined with very few rain showers, produced extreme dry-year conditions in all creeks.

By mid-July only first priority water was available. Seasonal runoffs ranged between 35 and 70 percent of their long-term average.

A below normal crop yield was experienced throughout the valley, except where crops were supplemented with ground water. Several deep wells were drilled in Surprise Valley this season, providing a firm irrigation supply to fortunate ranchers.

After the first hay crop, only a few of the creeks had enough water to start a second irrigation. A good rain in mid-August was of great benefit, and a second crop of hay was harvested.

Bidwell Creek. Total stream runoff available to Bidwell Creek users during the period from April 1 through September 30 was 4,510 acre-feet or approximately 40 percent of normal (based on records since 1955).

Mill Creek. Total stream runoff available to Mill Creek users during the period from April 1 through September 30 was 2,140 acre-feet or approximately 40 percent of normal. From April through June, water was available for third priority allotments; however, by July 4 only first and second priorities were being filled. The stream continued to decline until only first priority users were receiving water at the end of the season.

Soldier Creek. Total stream runoff available to Soldier Creek users from March 19 through September 30 was 2,050 acre-feet, or approximately 55 percent of normal. All diversions were closely regulated during the rotation periods (March 19 to June 19) as the stream runoff was insufficient to satisfy all priorities (eight priorities during the upper users' cycle, seven during the lower users' cycle). After the middle of June the flow of Soldier Creek decreased at a fairly constant rate. Partial second priority allotments were satisfied through June after which the available water supply continued to recede until the season low was reached in August. At that time only first priority allotments were served.

Pine Creek. Total stream runoff available to Pine Creek users during the period March 20 through September 30 was 630 acre-feet or approximately 50 percent of normal. The stream system was operated according to the rotation schedule (an accumulated flow basis) as set forth in the court decree. On May 5 the flow in Pine Creek dropped below 4.0 cubic feet per second, thereby ending the rotation schedule. From this date through May 25 the flow was diverted in the North Channel. On May 28 the 1.6 cubic feet per second level was reached and, in accordance with the decree, the entire flow was then diverted into the Cressler Ditch to the Bordwell Ranch. This diversion continued for about three weeks, or as long as the water would reach the place of use. From June 20 throughout the remainder of the season, Pine Creek was essentially dry except for a few days in August.

Cedar Creek. Total stream runoff available to Cedar Creek users during the period April 1 through September 30 was about 1,340 acre-feet or approximately 50 percent of normal. No water was available to the fourth priority users (a total of

four priorities on this creek) this season, and the third priority allotments were satisfied for a short period during early May. Second priority regulation began during the middle of May with the streamflow declining steadily thereafter. The entire streamflow was diverted by the first priority user on May 27 and throughout the remainder of the season.

Deep Creek. Total stream runoff available to Deep Creek users during the period April 1 through September 30 was 1,230 acre-feet or approximately 35 percent of normal. The entire flow of Deep Creek was diverted into the Company Ditch throughout the entire season since only partial first priority allotments were available (one priority on North Deep Creek).

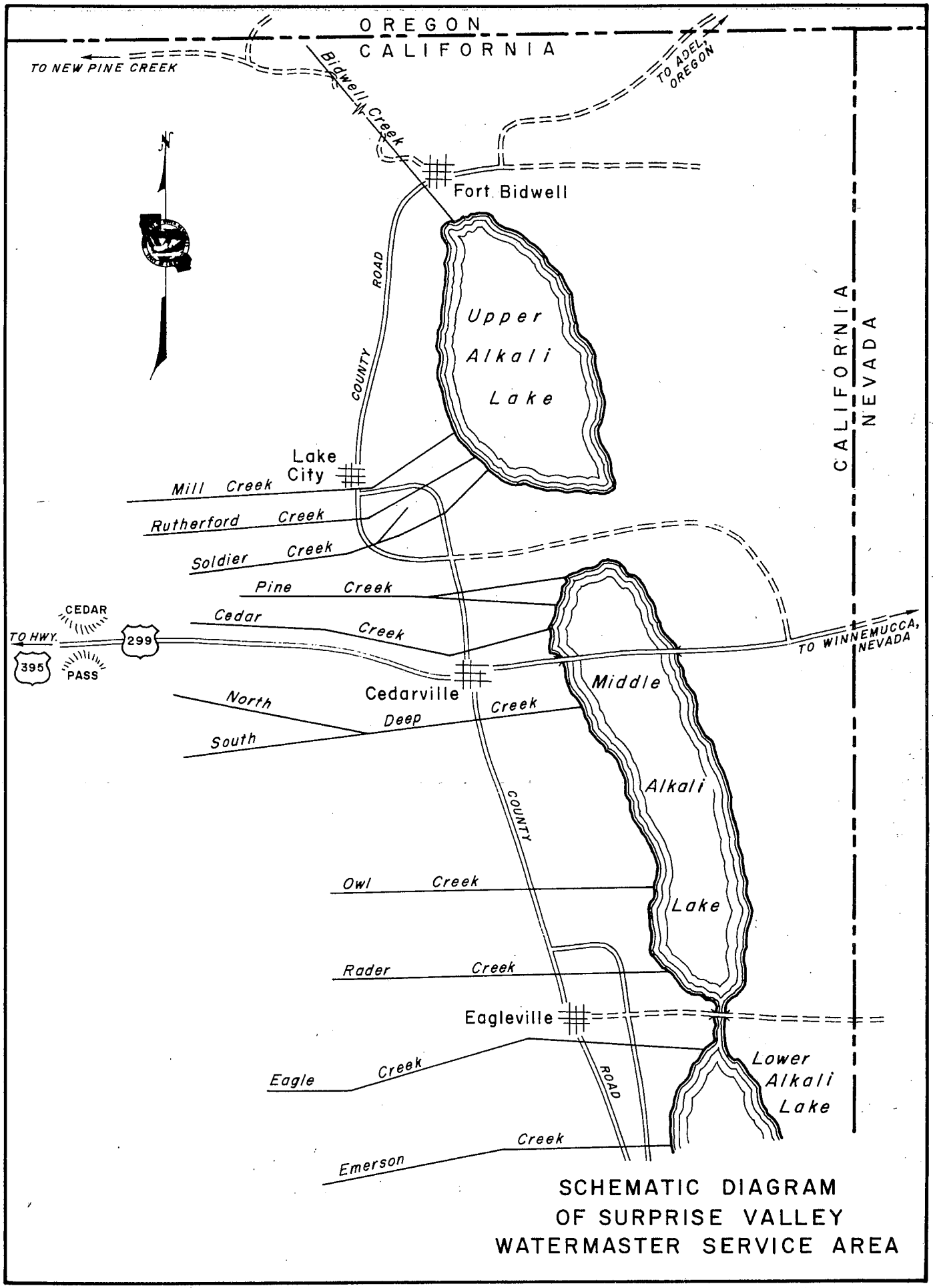
Second priority regulation began on South Deep Creek at the beginning of the season and continued through May 5. Throughout the remainder of the irrigation season first priority water was available in steadily decreasing amounts.

Owl Creek. Total stream runoff available to Owl Creek users during the period April 1 through September 30 was 4,210 acre-feet, or approximately 70 percent of normal. The flood control and distribution project is providing an excellent means of equitable distribution of irrigation waters. During the 1968 season the highest flow recorded in the system was 65 cubic feet per second, which is less than the design capacity of 75 cubic feet per second. The only distribution problem encountered was one of gravel and debris collecting at the intake. A sufficient water supply existed to fulfill only 15 of the 21 priorities throughout May and the first part of June. From then on and throughout the remainder of the season, the flow receded gradually. A flow of approximately 2 cubic feet per second was reached in late September. There was sufficient water available to supply only the first two of the "special" eight priority allotments during their respective periods.

Rader Creek. The total runoff available to Rader Creek users during the period April 1 through September 30 was 1,860 acre-feet, or approximately 50 percent of normal. All third priority water rights were filled until the middle of June. As the streamflow began receding, close regulation was required on all diversions to maintain equitable distribution. Diversion No. 1 was closed July 4 because there was no longer sufficient water available to reach the place of use. After that the streamflow receded steadily throughout the remainder of the irrigation season. Second priority allotments terminated on August 31 in accordance with the decree. For the remainder of the season only partial first priority water was available.

Eagle Creek. Total stream runoff available to Eagle Creek users during the period April 1 through September 30 was 2,890 acre-feet or approximately 55 percent of normal. As only enough water was available for partial third priorities, third priority users were put on a rotation schedule. In mid-August all third priority water was diverted by the Ford Ranch in accordance with the decree since channel losses were excessive in the lower reaches of the creek. Second priorities were shut off in mid-July and thereafter only first priority water was available (stock water and domestic garden water).

Emerson Creek. Total stream runoff available to Emerson Creek users during the period April 1 through September 30 was 1,710 acre-feet or 50 percent of normal. Only enough water existed to partially satisfy the second of four allotments. Full first allotments and part of second priority allotments were available through June. From then until the end of the season first priority allotments were available in steadily decreasing amounts until a low of 2 cubic feet per second was reached in mid-July. Emerson Creek users again supplemented their irrigation water supply by the use of several deep wells.



SCHEMATIC DIAGRAM
OF SURPRISE VALLEY
WATERMASTER SERVICE AREA

△ Permanent Recorder Station

March 15 through July 9
(major season of use)

(5) G. Peterson 0.38 cfs
C. Bucher 0.45 cfs
Sweeney 0.07 cfs

(6) Sweeney 0.18 cfs

(7) G. Peterson 0.50 cfs

(8) McConnaughy 7.24 cfs*
Town Users 0.06 cfs

(9) Conlan 7.63 cfs
Town Users 0.22 cfs

(10) Carey 6.13 cfs
C. Bucher 0.66 cfs
P. Peterson 0.44 cfs
Town Users 0.30 cfs

(11) C. Bucher 0.38 cfs

(12) U.S. Indian Service 0.46 cfs
Green 0.14 cfs
Baty 0.12 cfs

(13) McConnaughy 5.24 cfs*
Town Users 0.44 cfs

(15) Fee 8.94 cfs
Sagehorn 1.34 cfs
O'Callaghan 2.88 cfs
Toney 0.42 cfs

(17) Kober 0.05 cfs

(20) Sagehorn 0.88 cfs

(19A) (20) (20A) Carey 1.43 cfs

(21) Sagehorn 1.39 cfs

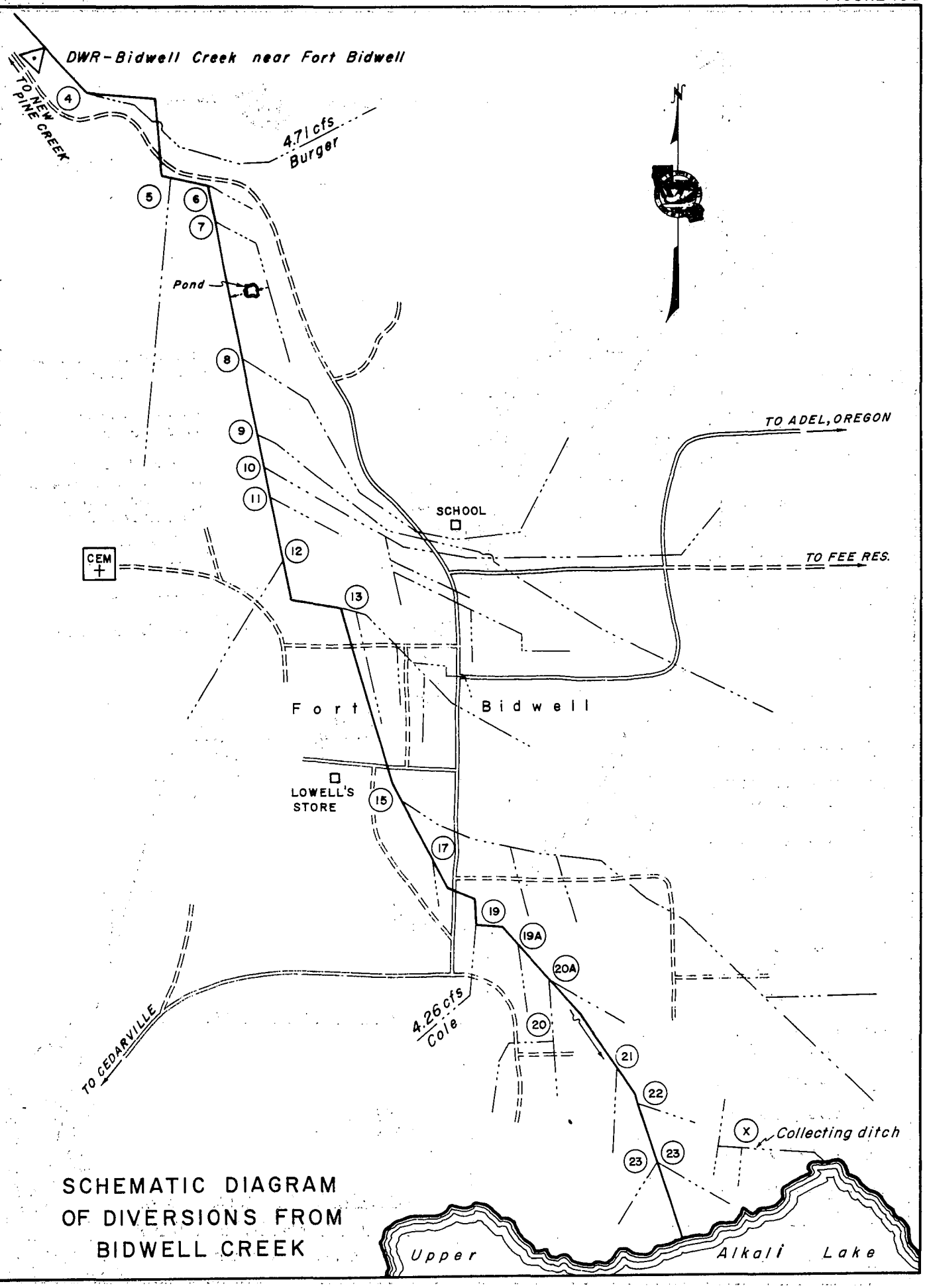
(22) O'Callaghan 0.38 cfs

(23) Sagehorn 1.79 cfs

(X) Sagehorn — If flow is less than 3.82 cfs, deficiency is made up by additional diversion through (15) if Fee Ranch allotment is satisfied.

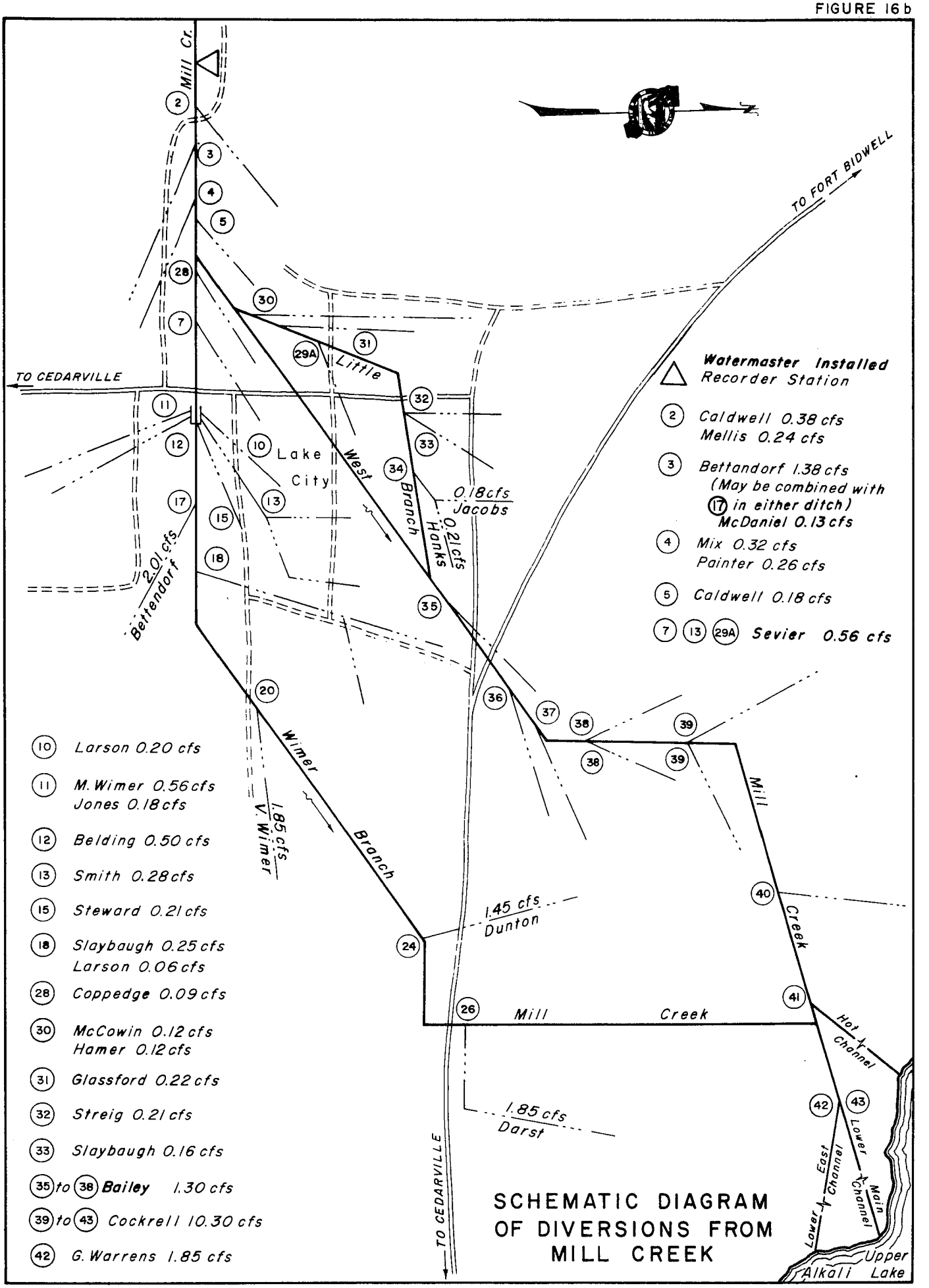
* May be used in either ditch

NOTE: Sagehorn and O'Callaghan waters may be used in any of their ditches at discretion of user and watermaster.



SCHEMATIC DIAGRAM OF DIVERSIONS FROM BIDWELL CREEK

FIGURE 16 b



SCHEMATIC DIAGRAM OF DIVERSIONS FROM MILL CREEK

FIGURE 16c

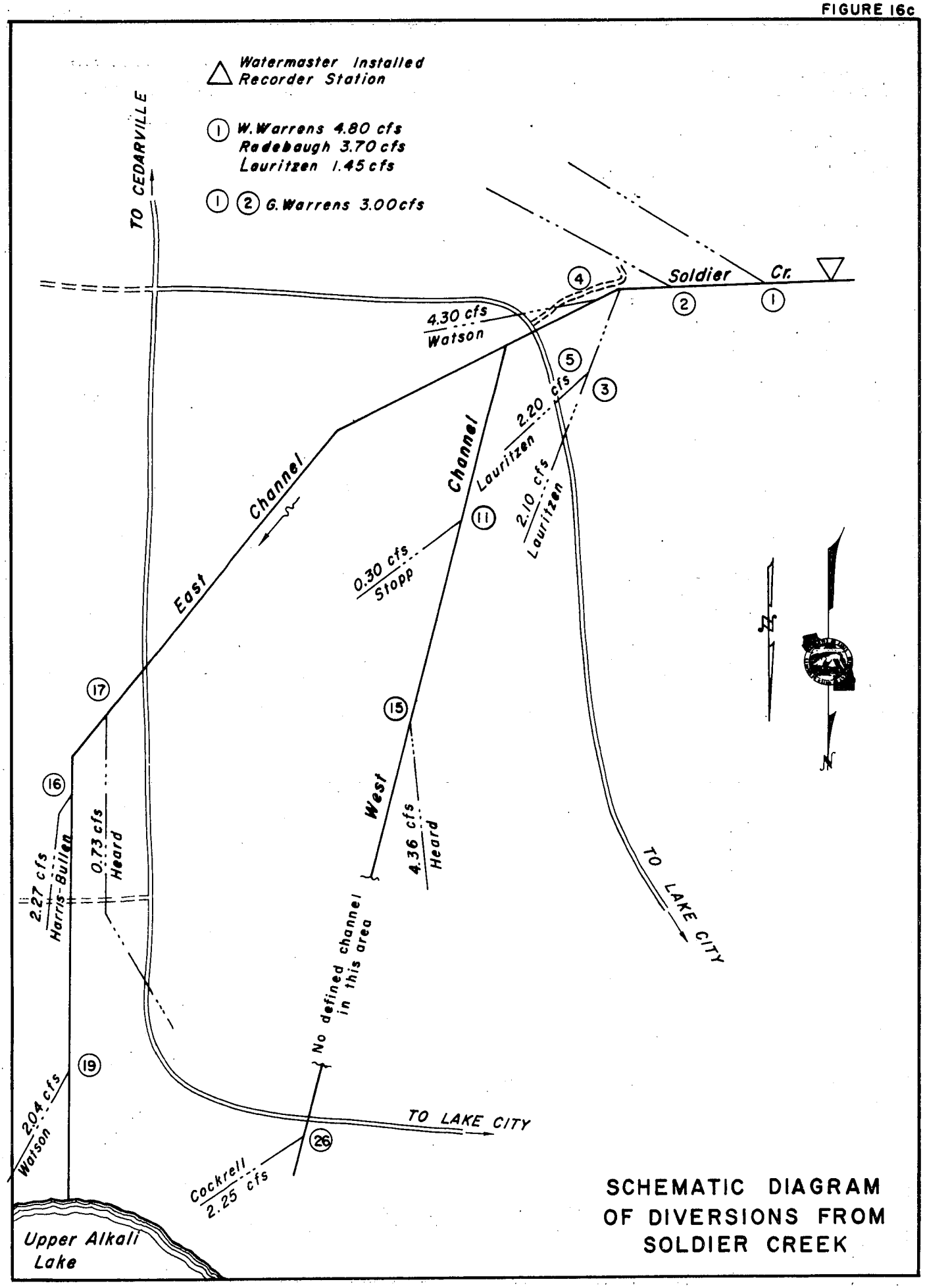

Watermaster Installed Recorder Station
(1) W. Warrens 4.80 cfs
Radebaugh 3.70 cfs
Lauritzen 1.45 cfs
(1) (2) G. Warrens 3.00 cfs
TO CEDARVILLE
Soldier Cr.
4.30 cfs Watson
East Channel
Channel
2.20 cfs Lauritzen
2.10 cfs Lauritzen
0.30 cfs Stopp
West
4.36 cfs Heard
0.73 cfs Heard
2.27 cfs Harris-Bullen
No defined channel in this area
TO LAKE CITY
TO LAKE CITY
2.04 cfs Watson
Cockrell 2.25 cfs
Upper Alkali Lake
SCHEMATIC DIAGRAM OF DIVERSIONS FROM SOLDIER CREEK

FIGURE 16 d

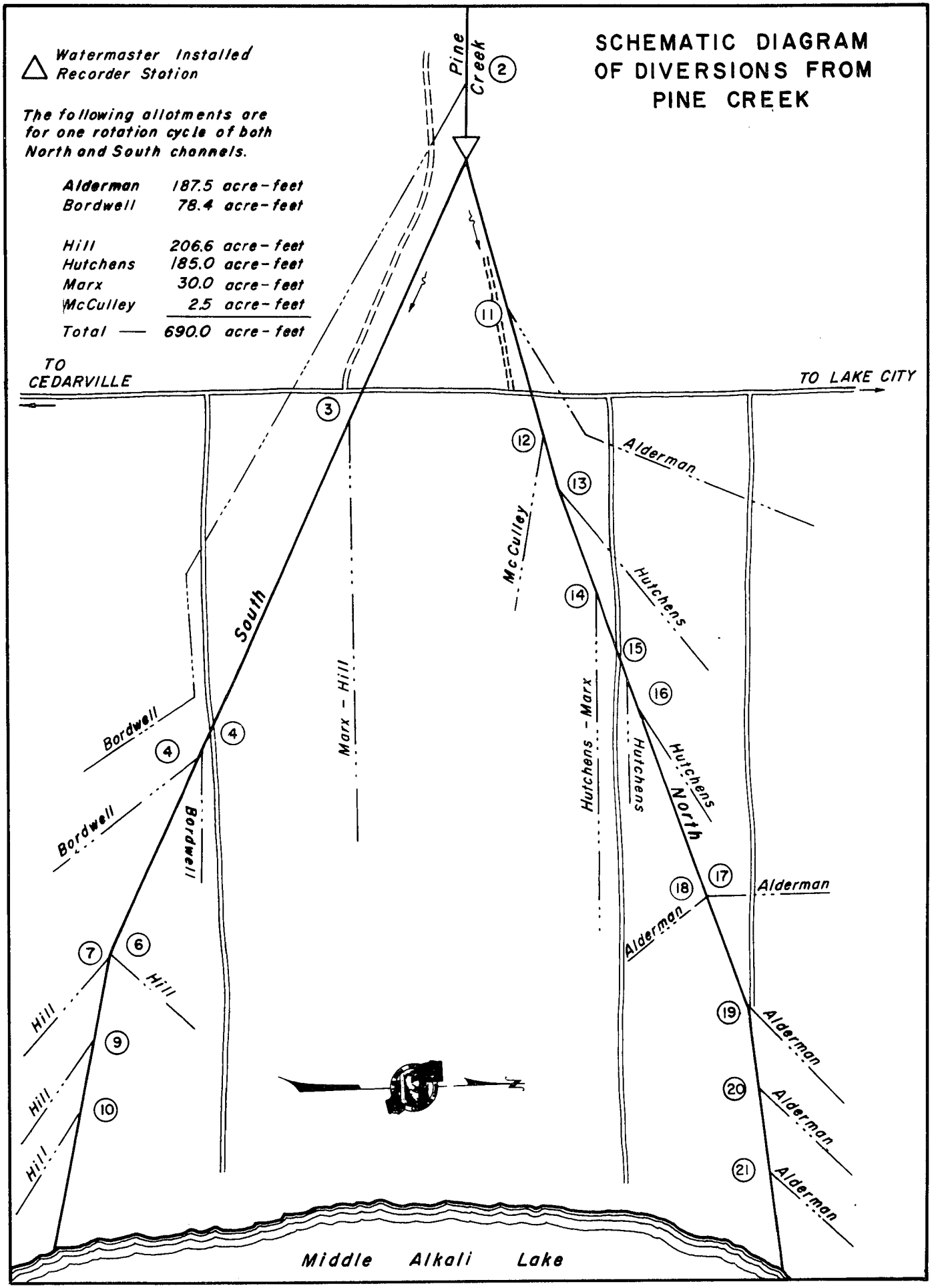

SCHEMATIC DIAGRAM OF DIVERSIONS FROM PINE CREEK
Watermaster Installed Recorder Station
The following allotments are for one rotation cycle of both North and South channels.
Alderman 187.5 acre-feet
Bordwell 78.4 acre-feet
Hill 206.6 acre-feet
Hutchens 185.0 acre-feet
Marx 30.0 acre-feet
McCulley 2.5 acre-feet
Total — 690.0 acre-feet
Pine Creek
TO CEDARVILLE
TO LAKE CITY
South
North
Bordwell
Hill
Marx - Hill
McCulley
Hutchens
Hutchens - Marx
Alderman
Middle Alkali Lake

FIGURE 16 e

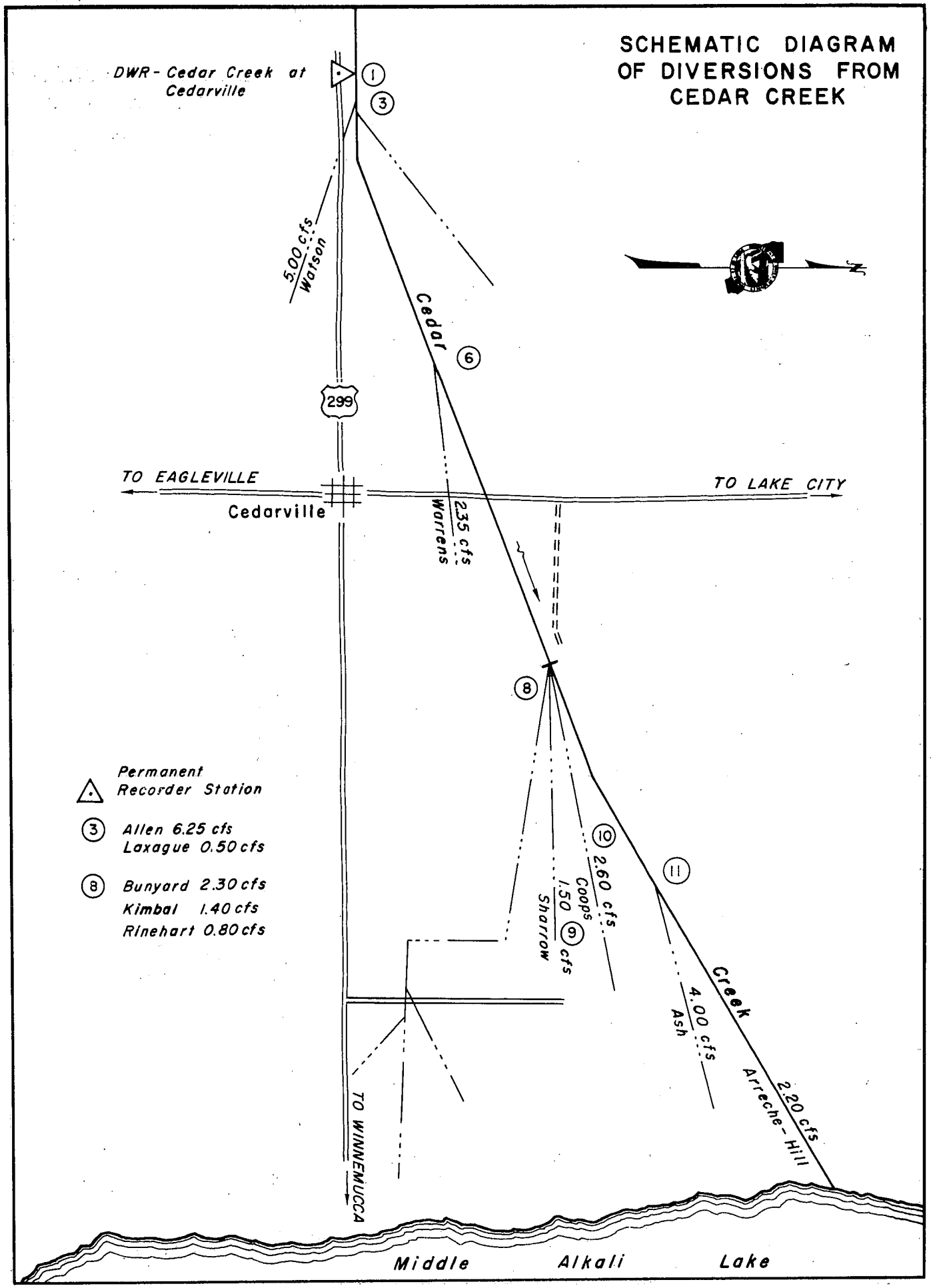

SCHEMATIC DIAGRAM OF DIVERSIONS FROM CEDAR CREEK
DWR - Cedar Creek at Cedarville
1
3
500 c.f.s. Watson
Cedar
6
299
TO EAGLEVILLE
TO LAKE CITY
Cedarville
2.35 cfs Warrens
8
Permanent Recorder Station
3 Allen 6.25 cfs
Laxague 0.50 cfs
8 Bunyard 2.30 cfs
Kimbal 1.40 cfs
Rinehart 0.80 cfs
10
2.60 cfs
Coops
1.50
Sharrow
9
cfs
11
4.00 cfs
Ash
Creek
2.20 cfs
Arreche - Hill
TO WINNEMUCCA
Middle
Alkali
Lake

FIGURE 16 f

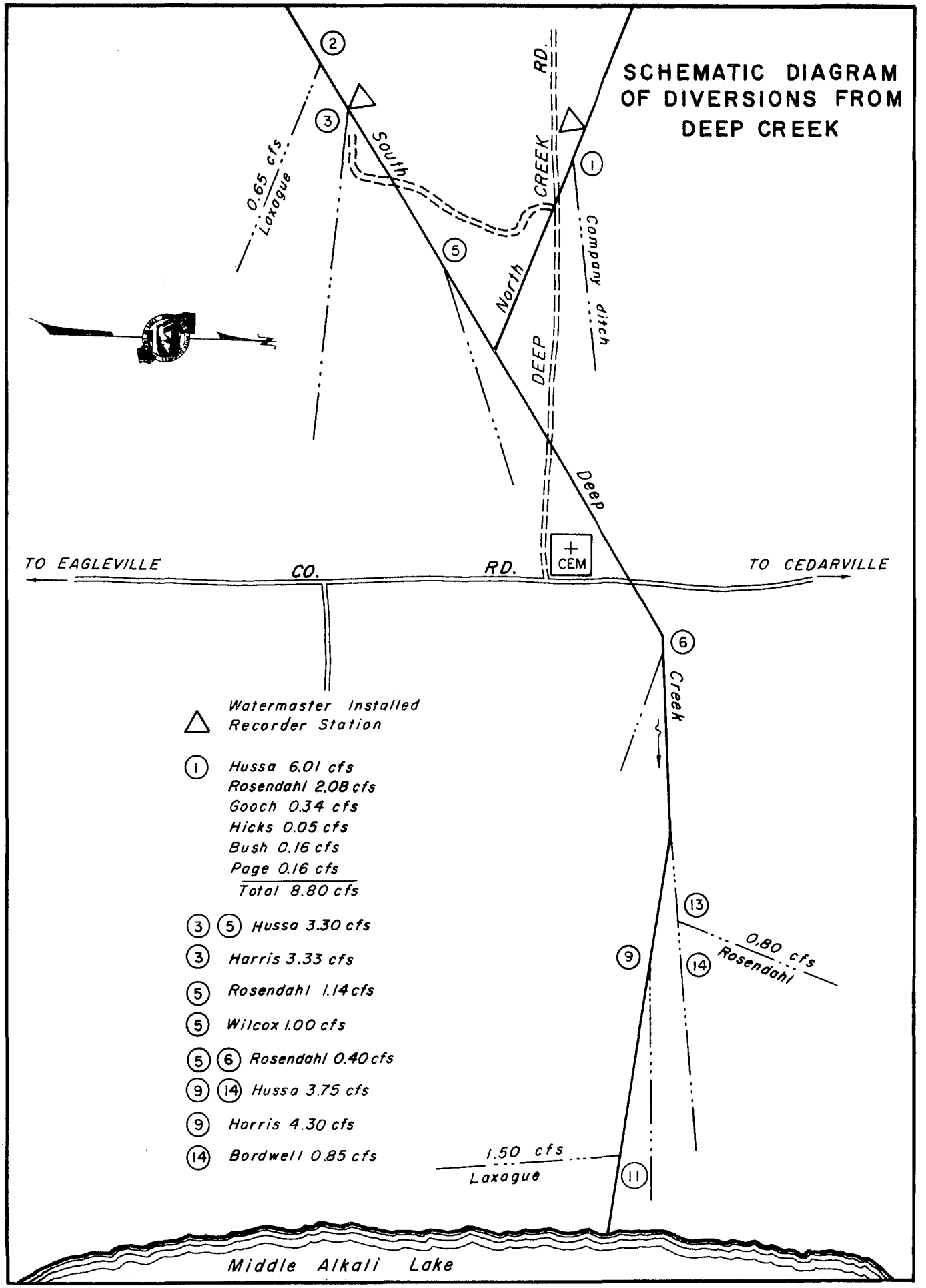

SCHEMATIC DIAGRAM OF DIVERSIONS FROM DEEP CREEK
South
CREEK
RD.
North
DEEP
Deep
Creek
Company ditch
0.65 cfs
Laxague
TO EAGLEVILLE
CO.
RD.
CEM
TO CEDARVILLE
Watermaster Installed
Recorder Station
① Hussa 6.01 cfs
Rosendahl 2.08 cfs
Gooch 0.34 cfs
Hicks 0.05 cfs
Bush 0.16 cfs
Page 0.16 cfs
Total 8.80 cfs
③ ⑤ Hussa 3.30 cfs
③ Harris 3.33 cfs
⑤ Rosendahl 1.14 cfs
⑤ Wilcox 1.00 cfs
⑤ ⑥ Rosendahl 0.40 cfs
⑨ ⑭ Hussa 3.75 cfs
⑨ Harris 4.30 cfs
⑭ Bordwell 0.85 cfs
0.80 cfs
Rosendahl
1.50 cfs
Laxague
Middle Alkali Lake

FIGURE 16g

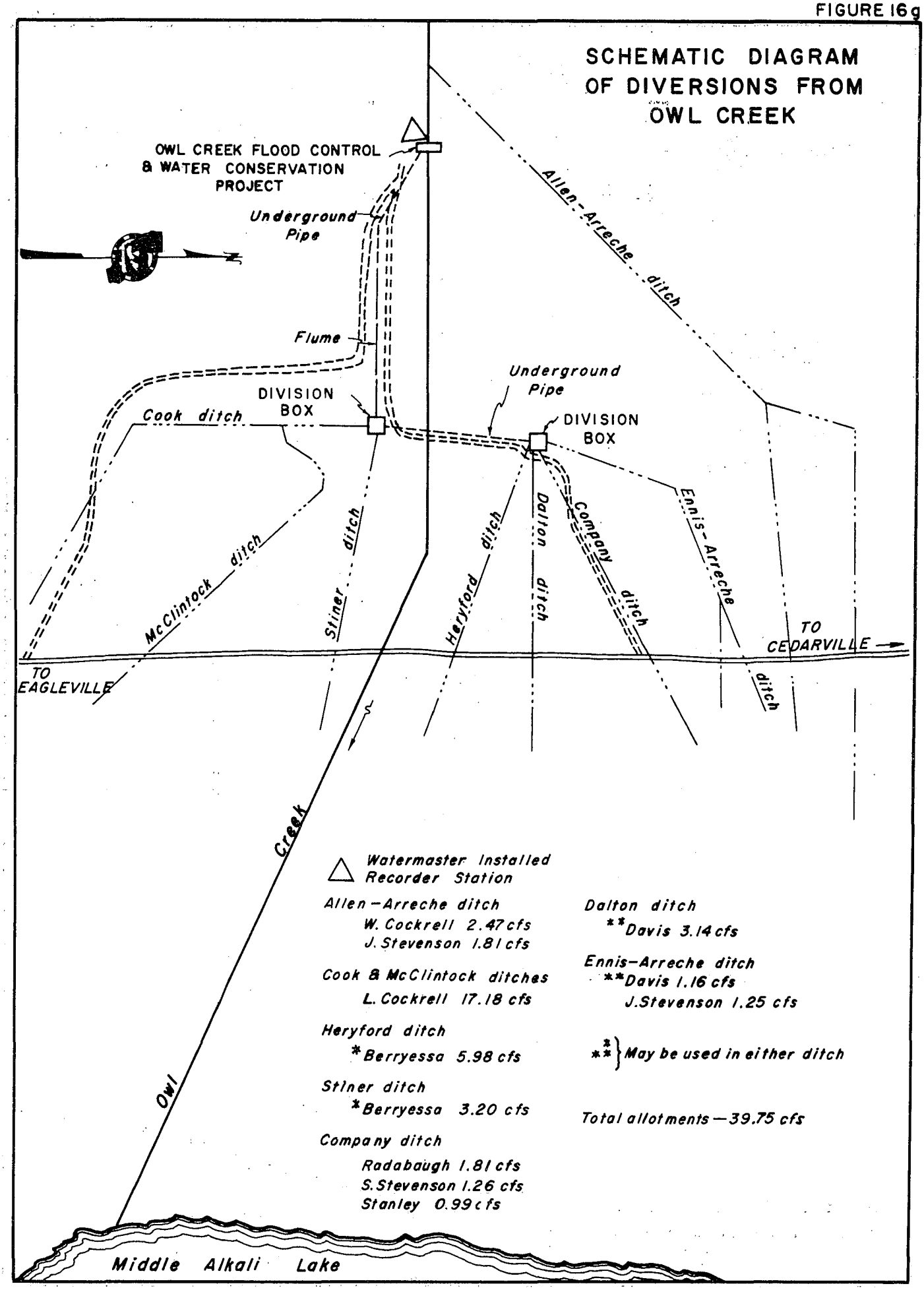
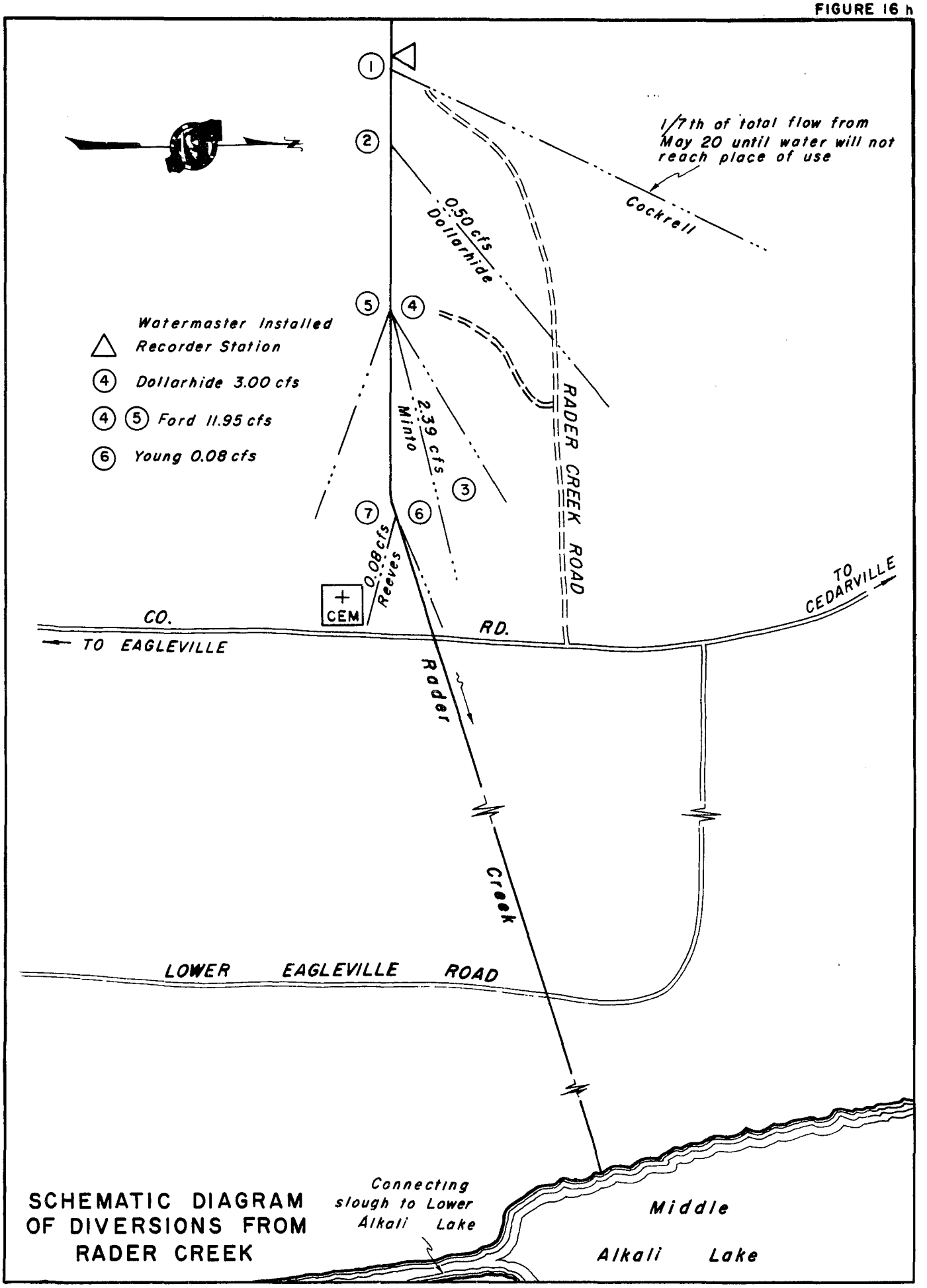

SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
OWL CREEK
OWL CREEK FLOOD CONTROL
& WATER CONSERVATION
PROJECT
Underground
Pipe
Allen-Arreche ditch
Flume
Underground
Pipe
DIVISION
BOX
DIVISION
BOX
Cook ditch
McClintock ditch
Stiner ditch
Heryford ditch
Dalton ditch
Company ditch
Ennis-Arreche ditch
TO
CEDARVILLE
TO
EAGLEVILLE
Owl Creek
Middle Alkali Lake
Watermaster Installed
Recorder Station
Allen-Arreche ditch
W. Cockrell 2.47 cfs
J. Stevenson 1.81 cfs
Cook & McClintock ditches
L. Cockrell 17.18 cfs
Heryford ditch
*Berryessa 5.98 cfs
Stiner ditch
*Berryessa 3.20 cfs
Company ditch
Radabaugh 1.81 cfs
S. Stevenson 1.26 cfs
Stanley 0.99 cfs
Dalton ditch
**Davis 3.14 cfs
Ennis-Arreche ditch
**Davis 1.16 cfs
J. Stevenson 1.25 cfs
*, ** May be used in either ditch
Total allotments — 39.75 cfs

FIGURE 16 h



SCHEMATIC DIAGRAM OF DIVERSIONS FROM RADER CREEK

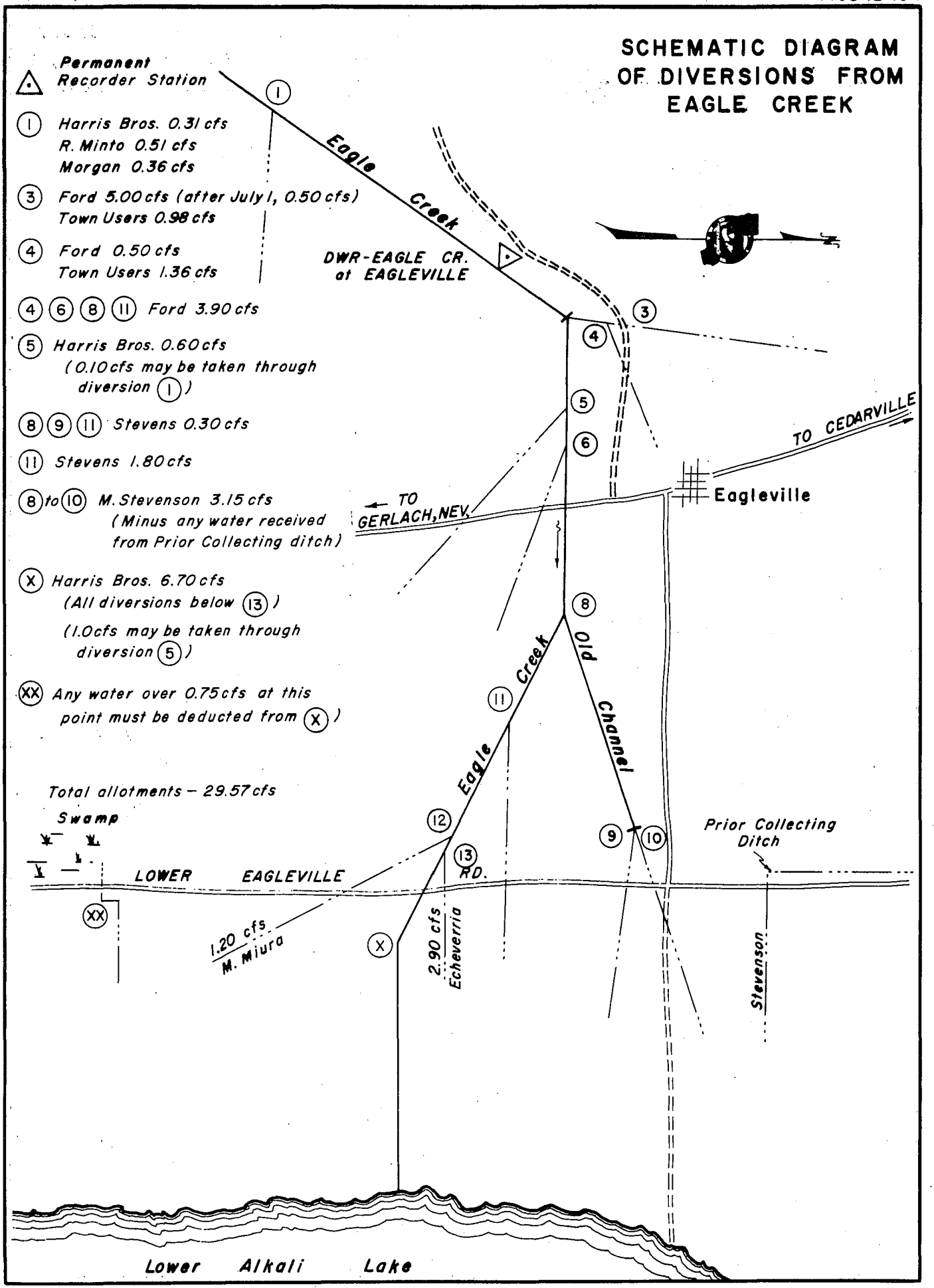
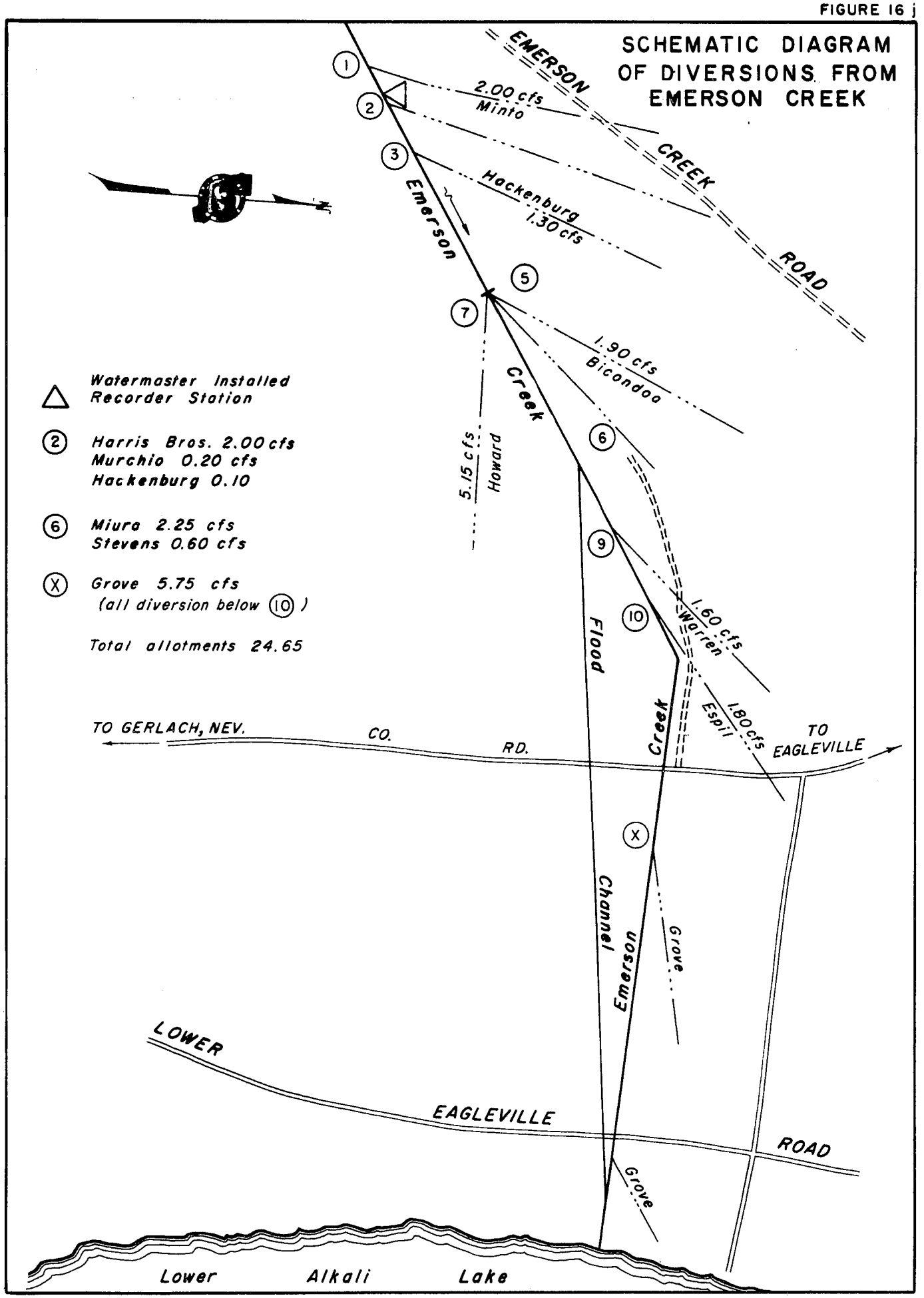

SCHEMATIC DIAGRAM OF DIVERSIONS FROM EAGLE CREEK
Permanent Recorder Station
(1) Harris Bros. 0.31 cfs
R. Minto 0.51 cfs
Morgan 0.36 cfs
(3) Ford 5.00 cfs (after July 1, 0.50 cfs)
Town Users 0.98 cfs
(4) Ford 0.50 cfs
Town Users 1.36 cfs
(4) (6) (8) (11) Ford 3.90 cfs
(5) Harris Bros. 0.60 cfs
(0.10 cfs may be taken through diversion (1))
(8) (9) (11) Stevens 0.30 cfs
(11) Stevens 1.80 cfs
(8) to (10) M. Stevenson 3.15 cfs
(Minus any water received from Prior Collecting ditch)
(X) Harris Bros. 6.70 cfs
(All diversions below (13))
(1.0 cfs may be taken through diversion (5))
(XX) Any water over 0.75 cfs at this point must be deducted from (X))
Total allotments – 29.57 cfs
Eagle Creek
DWR-EAGLE CR. at EAGLEVILLE
TO CEDARVILLE
TO GERLACH, NEV.
Eagleville
Old Eagle Creek Channel
Prior Collecting Ditch
Swamp
LOWER EAGLEVILLE RD.
1.20 cfs M. Miura
2.90 cfs Echeverria
Stevenson
Lower Alkali Lake

FIGURE 16 j


SCHEMATIC DIAGRAM OF DIVERSIONS FROM EMERSON CREEK
EMERSON CREEK ROAD
Emerson Creek
Flood Channel
Creek
Warren Creek
Grove
Grove
Grove
2.00 cfs Minto
Hackenburg 1.30 cfs
1.90 cfs Bicondoo
5.15 cfs Howard
1.60 cfs
1.80 cfs Espil
Watermaster Installed Recorder Station
(2) Harris Bros. 2.00 cfs
Murchio 0.20 cfs
Hackenburg 0.10
(6) Miura 2.25 cfs
Stevens 0.60 cfs
(X) Grove 5.75 cfs
(all diversion below (10))
Total allotments 24.65
TO GERLACH, NEV.
CO. RD.
TO EAGLEVILLE
LOWER EAGLEVILLE ROAD
Lower Alkali Lake

Susan River Watermaster Service Area

The Susan River service area is located in the southern part of Lassen County in the vicinity of Susanville. There are 163 water right owners in the service area with total allotments of 351.732 cubic feet per second. The primary place of use is in Honey Lake Valley between Susanville and the northwest shore of Honey Lake, a distance of about 25 miles. The valley floor is at an elevation of about 4,000 feet. The source of supply is comprised of three stream systems: Susan River and tributaries, Baxter Creek and tributaries, and Parker Creek.

Susan River originates on the east slope of the Sierra Nevada immediately east of Lassen National Park at an elevation of about 7,900 feet. Its channel runs easterly from Silver Lake through McCoy Flat Reservoir, the town of Susanville, and then to Honey Lake.

Susan River has four major tributaries: Piute Creek, entering from the north at Susanville; Gold Run and Lassen Creeks, entering from the south between Susanville and Johnstonville; and Willow Creek, entering from the north above Standish. Gold Run and Lassen Creeks rise on the north slope of Diamond Mountain at an elevation of about 7,600 feet. The watersheds of Piute and Willow Creeks are on the south slopes of Round Valley Mountain at lower elevations.

A short distance below its confluence with Willow Creek the Susan River divides into three channels: Tanner Slough Channel on the north, Old Channel in the middle, and Dill Slough Channel on the south. Hartson Slough and Whitehead Slough divert from Dill Slough on its south bank farther downstream.

The Baxter Creek stream system is located in Honey Lake Valley on the east slope of the Sierra Nevada about 10 miles southeast of Susanville. The principal creeks in the system are: Baxter Creek, which rises in the extreme western portion of the basin and flows in an easterly direction, and Elesian, Sloss, and Bankhead Creeks, which are tributaries of Baxter Creek from the south.

Parker Creek is situated in Honey Lake Valley on the east slope of the Sierra Nevada about 15 miles southeast of Susanville. It rises on the east slope of Diamond Mountain and flows in an easterly direction for about 5 miles into Honey Lake.

A schematic drawing of each major stream system within the Susan River service area is presened as Figures 17 through 17e, pages 126 through 133.

Water Supply

The water supply in the Susan River service area is obtained from two major sources, snowmelt runoff and springs. Snowpack on the Willow Creek Valley and Piute Creek watersheds, which embrace more than one-half of the Susan River stream system, melts early in the spring and is usually depleted by May 1. Irrigation requirements from this portion of the stream system are then almost entirely dependent on the flow of springs that are relatively constant throughout the year.

Under average flow conditions, Lassen, Gold Run, Baxter, and Parker Creeks and Susan River above Susanville are sustained by snowmelt runoff until early June. The flow from perennial springs in this portion of the system is comparatively small.

The Lassen Irrigation District stores supplemental water in Hog Flat and

McCoy Reservoirs, located on the headwaters of the Susan River. This stored water is released into the Susan River Channel and commingled with the natural flow, usually during June and July. It is then rediverted into Lake Leavitt for further distribution by the irrigation district.

Records of the daily mean discharge of the several stream gaging stations in the service area are presented in Tables 52 through 57, pages 123 and 124.

Methods of Distribution

Irrigation in the Susan River service area is accomplished by placing dams in the main channels, thus raising the water level for subsequent diversion into canals and ditches. These diversion dams are relatively large on the Susan River Channel and much smaller on the tributaries. Wild flooding is the most common method of irrigation in practice. Portions of the irrigated lands have been leveled, permitting a more efficient use of water by using border checks and furrows. Subirrigation occurs in some areas incidental to surface irrigation or as a result of seepage from ditches and creek channels.

The Lassen Irrigation Company is entitled to divert or store up to the present capacity of its reservoirs from the natural flow of Susan River between March 1 and July 1 of each year when the flow of the Susan River immediately above Willow Creek is greater than 20 cubic feet per second. The company may divert at all other times when the flow of the Susan River immediately above Willow Creek is more than 5 cubic feet per second in spite of the allotments granted to users in Schedules 3 and 6 and to users of third priority class in Schedule 5 of the Susan River decree. When the flow of the Susan River immediately above Willow Creek is below the required amount, the watermaster then measures the inflow to McCoy Flat Reservoir, and if available, releases the amount required. A transportation loss of 15 percent, or a minimum of two cubic feet per second, is deducted from all water that is transferred from Lassen Irrigation Company upstream storage reservoirs to Lake Leavitt.

The several decrees (see Table 1) which apply to the Susan River service area establish the following number of priority classes for the major stream systems and distribution areas: Baxter Creek - five; Parker Creek - four; Gold Run Creek - three; Lassen Creek - two; Piute and Hills Creek - one; Willow Creek - two; and Susan River - three. Geographical features are such that the Susan River, Willow Creek and Lower Susan River areas are subject to interrelated priorities.

1968 Distribution

Watermaster service began April 1 in the Susan River service area and continued until September 30. Kenneth E. Morgan, Water Resources Engineering Associate, was watermaster during this period.

The available natural water supply throughout the Susan River service area was below average; however, due to a good carryover from the end of the 1967 season at McCoy Flat Reservoir, the Lassen Irrigation Company water supply was about average.

Parker Creek. The available water supply in Parker Creek was sufficient to satisfy all allotments (four priorities) until May 10. From May 10 to May 20 the flow decreased rapidly to first priority allotments. From May 20 throughout the remainder of the season only first priority allotments were served.

Baxter Creek. The available water supply was sufficient to satisfy 50 percent of third priority allotments (a total of five priorities) until April 30. The flow decreased from May 1 to May 20 when approximately 50 percent of second priority

TABLE 52
DAILY MEAN DISCHARGE

SUSAN RIVER AT SUSANVILLE

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	176	208	93	125	79	6.9	2.9
2	152	178	99	122	80	6.3	2.5
3	154	156	105	120	80	5.1	2.8
4	144	148	105	123	79	3.4	2.5
5	142	148	99	117	79	2.6	2.3
6	141	133	92	135	79	2.3	2.3
7	126	126	88	120	76	1.9	2.0
8	125	123	86	108	75	2.0	2.0
9	109	123	84	96	75	2.0	2.2
10	99	133	81	99	76	1.9	2.3
11	93	152	80	109	76	1.8	2.5
12	90	158	78	106	75	1.7	2.5
13	90	133	84	105	76	1.8	2.8
14	93	125	86	105	76	2.0	2.9
15	101	123	120	102	75	2.3	3.0
16	115	117	115	98	74	4.8	3.0
17	104	106	108	96	73	7.9	3.0
18	91	101	102	97	72	4.4	3.0
19	84	97	98	96	71	6.3	2.9
20	84	91	98	94	73	9.0	3.4
21	85	86	125	94	75	8.8	3.9
22	86	81	144	88	76	7.7	4.2
23	91	80	150	85	84	5.9	4.2
24	97	80	150	84	85	4.7	4.2
25	122	80	141	82	81	3.9	4.0
26	118	79	132	80	50	3.8	3.9
27	108	80	123	79	18	3.3	3.9
28	120	79	132	79	9.8	3.4	3.6
29	154	84	125	79	7.1	3.4	3.6
30	194	90	133	79	6.3	3.0	3.9
31	210		130		5.5	2.8	
Mean	119	117	109	100	65.0	4.1	3.1
Runoff in acre-feet	7330	6940	6720	5950	4000	252	183

TABLE 53
DAILY MEAN DISCHARGE

GOLD RUN CREEK NEAR SUSANVILLE

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1		16*	23	12	2.6	1.2	0.7
2		16	23	12	2.6	1.3	0.7
3		14	24	12	2.5	1.2	0.6
4		13	24	10	2.3	1.0	0.7
5		13	25	10	2.2	0.9	0.6
6		12	23	10	2.0	0.8	0.6
7		12	22	9.4	1.8	0.8	0.6
8		12	22	8.8	1.7	0.7	0.6
9		12	22	7.5	1.7	0.7	0.6
10		13	22	7.2	1.6	0.7	0.6
11		14	22	6.9	1.5	0.7	0.6
12		15	21	6.6	1.5	0.7	0.6
13		16	20	6.1	1.5	0.6	0.8
14		16	19	5.8	1.5	0.7	0.8
15		16	18	5.8	1.4	0.8	0.8
16		16	17	5.6	1.4	1.1	0.7
17		15	17	5.1	1.4	1.6	0.7
18		13	18	4.9	1.3	1.3	0.8
19		13	18	4.6	1.3	1.5	0.8
20		13	20	4.4	1.2	1.6	0.9
21		12	19	4.4	1.1	1.9	0.8
22		11	18	4.0	1.0	1.3	0.8
23		11	18	4.0	0.9	1.0	0.8
24		12	16	3.8	0.9	0.9	0.8
25		12	15	3.4	0.8	0.8	0.8
26		12	15	3.3	0.8	0.8	0.8
27		12	15	3.1	0.8	0.8	0.8
28		13	15	3.1	0.8	0.7	0.8
29		14	15	3.1	0.7	0.7	0.9
30		17	15	3.1	0.7	0.7	0.9
31			13		0.9	0.7	
Mean		13.5	19.2	6.3	1.4	1.0	0.7
Runoff in acre-feet		805	1180	377	88	60	44

* Beginning of Record

TABLE 54
DAILY MEAN DISCHARGE

SUSAN RIVER AT JOHNSTONVILLE BRIDGE

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1		140*	19	25	4.0	1.3	0.4
2		130	20	24	4.0	1.3	0.4
3		88	20	22	3.9	1.4	0.5
4		71	29	21	3.8	1.2	0.5
5		80	28	21	3.7	1.0	0.5
6		63	27	19	3.3	1.1	0.5
7		47	26	18	3.2	0.9	0.5
8		44	23	19	3.0	0.9	0.5
9		47	23	17	2.9	0.7	0.5
10		54	23	16	2.8	0.7	0.5
11		63	23	15	2.7	0.6	0.5
12		80	24	15	2.3	0.6	0.5
13		60	24	14	2.2	0.6	0.5
14		50	25	13	1.9	0.6	0.5
15		50	24	12	1.8	0.6	0.5
16		50	26	11	1.7	0.5	0.5
17		34	28	10	1.5	0.5	0.5
18		24	30	9.0	1.5	0.5	0.5
19		21	30	8.0	1.7	0.5	0.5
20		19	32	7.0	1.7	0.4	0.5
21		15	35	6.0	1.9	0.4	0.5
22		14	30	5.5	1.9	0.4	0.5
23		14	40	4.8	2.0	0.4	0.5
24		14	45	4.8	1.9	0.4	0.5
25		16	40	4.8	1.7	0.4	0.5
26		18	37	4.7	1.4	0.4	0.5
27		16	30	4.6	1.3	0.4	0.5
28		16	30	4.4	1.4	0.4	0.5
29		16	32	4.2	1.3	0.5	0.5
30		18	33	4.0	1.1	0.5	0.5
31			25		1.0	0.5	
Mean		45.7	28.4	12.1	2.3	0.7	0.5
Runoff in acre-feet		2720	1750	722	140	41	29

* Beginning of Record

TABLE 55
DAILY MEAN DISCHARGE

WILLOW CREEK NEAR SUSANVILLE

March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1	83	17	15	14	11	9.9	10
2	83	17	17	14	11	9.8	10
3	73	13	18	14	11	9.6	10
4	63	14	17	14	11	9.4	10
5	56	16	15	13	11	9.4	10
6	52	17	14	14	11	9.3	10
7	44	17	14	14	11	9.4	10
8	38	17	14	16	11	9.3	10
9	35	16	14	14	10	9.3	10
10	32	14	13	14	10	9.3	10
11	31	15	14	14	10	9.3	11
12	26	12	14	14	10	12	11
13	26	12	14	13	10	9.9	10
14	28	12	14	14	10	9.2	10
15	28	14	14	13	10	9.2	10
16	25	16	15	13	10	9.5	10
17	22	15	16	13	10	9.3	10
18	19	14	15	12	10	9.2	10
19	17	14	14	12	10	9.2	10
20	16	14	14	12	10	9.2	10
21	16	14	15	11	10	9.2	10
22	18	15	15	11	10	9.2	10
23	16	16	15	11	10	9.2	10
24	16	16	15	11	10	9.2	10
25	16	15	15	11	10	9.3	12
26	15	15	15	11	10	9.2	13
27	15	15	15	11	9.8	9.2	12
28	14	15	14	11	9.9	9.3	13
29	15	15	15	11	9.9	14	13
30	16	15	14	11	9.8	11	13
31	17		14		9.9	10	
Mean	31.6	14.9	14.7	12.7	10.2	9.7	10.6
Runoff in acre-feet	1950	887	906	756	629	594	631

TABLE 56
DAILY MEAN DISCHARGE
WILLOW CREEK NEAR LITCHFIELD
March through September 1968
(In second-feet)

Day	March	April	May	June	July	August	September
1		20*	18	15	15	17	17
2		20	17	15	15	17	17
3		18	20	15	16	16	17
4		16	21	15	15	15	18
5		19	19	14	15	15	18
6		20	18	17	15	15	17
7		20	16	17	15	15	18
8		20	16	18	15	15	17
9		20	15	19	15	15	17
10		16	14	17	15	15	17
11		18	14	17	14	15	17
12		14	15	17	14	17	18
13		13	15	17	14	19	18
14		14	15	17	14	15	17
15		16	15	17	14	14	16
16		20	16	17	14	16	16
17		21	16	17	14	16	16
18		19	16	16	14	15	17
19		18	16	15	14	15	17
20		18	16	15	14	16	18
21		18	15	15	14	16	18
22		19	16	16	14	17	18
23		20	16	16	15	16	17
24		21	17	15	15	15	17
25		19	16	15	15	15	20
26		19	16	16	15	15	22
27		20	16	16	15	15	22
28		19	15	15	15	15	22
29		18	14	15	15	20	22
30		18	14	15	15	22	22
31			14		17	19	
Mean		18.4	16.0	16.0	14.7	16.1	18.1
Runoff in acre-feet		1090	986	954	904	988	1080

* Beginning of Record

TABLE 57
DAILY MEAN DISCHARGE
OPERATION OF McCOY AND HOG FLAT RESERVOIRS
May through July 1968
(In second-feet)

Day	Susan River Inflow to McCoy Flat Res.		McCoy Flat Res. Releases to Susan River			Hog Flat Res. Releases to Susan River		Transfer of Lassen Irrig. Dist. Water from McCoy Flat and Hog Flat Res. to Lake Leavitt		
	May	June	May	June	July	May	June	May	June	July
1		18		91	72	14 3/	5.0	12 1/	66	61
2		17		91	72	14	4.0	12	66	61
3		16		90	72	14	3.0	12	65	61
4		15		82	70	13	2.0 4/	11	59	60
5		13		85	70	13	1.0 4/	11	62	60
6		12		85	70	13		11	62	59
7		10		77	69	13		11	57	59
8		9.0		70	67	12		10	52	57
9		8.0		72	69	12		10	54	59
10		6.0		84	69	12		10	66	59
11		4.0		88	67	11		9.0	71	57
12		2.0 5/		87	69	11		9.0	72	59
13		1.0 5/		88	70	11		9.0	74	60
14	35 1/			88	77	41		35	75	65
15	35			84	77	59		50	71	65
16	35			81	76	54		46	69	65
17	35			82	76	50		43	70	65
18	35			82	75	46		39	70	64
19	35			79	77	42		36	67	65
20	35		28 3/	77	80	38		52	65	68
21	34		54	75	84	36		74	63	71
22	34		52	74	90	33		67	63	76
23	33		60	74	94	30		71	63	80
24	32		70	70	88	27		76	60	75
25	30		66	69	50	23		70	59	43
26	29		62	67	25	20		60	57	21
27	27		72	69	7.0	17		88	59	9.0 2/
28	25		76	66	5.0 4/	14		77	56	3.0 2/
29	23		83	67	1.0 4/	12		68	57	
30	22		91	67		10		71	57	
31	20		91			8.0		68		
Mean	30.8	10.1	67.1	78.7	65.1	23.3	3.0	39.6	63.6	57.4
Runoff in acre-feet	1100	260	1600	4680	3740	1430	30	2440	3780	3190

1/ Beginning of Record
2/ End of Record
3/ Beginning of Releases
4/ End of Releases
5/ End of Flow

allotments were supplied. The flow at diversion Number 75 was 1.0 cubic foot per second on June 17, which requires all of the flow at this point to be diverted into the Long Ditch for stockwater. From June 30 throughout the remainder of the season only stockwater was served.

Lassen-Holtzclaw Creek. The available water supply in Lassen-Holtzclaw Creek was sufficient to meet all allotments (two priorities) until May 20. The flow decreased to first priority allotments on June 18. From June 18 throughout the remainder of the season the Tangeman Ranch was entitled to all of the water available in the stream system.

Hills Creek. The available water supply in Hills Creek was sufficient to supply all allotments (one priority) until about May 20. On June 15 approximately 25 percent of allotments were being served. There was insufficient flow in the Creek for the users from diversion 220 after July 10. Only stockwater was available to the Amesbury Ranch from July 10 throughout the remainder of the season. All storage facilities on Hills Creek were filled during May.

Gold Run Creek. The available water supply in Gold Run Creek was sufficient to supply all allotments (three priorities) until May 20. From May 20 to June 18 the flow rapidly decreased to 25 percent of second priority allotments. After July 5 only first priority allotments were available.

Piute Creek. The available water supply in Willow Creek was sufficient to satisfy all allotments (two priorities) until April 12, at which time the Hansen and Hagata Ranches began irrigating. Throughout the remainder of the season the flow varied between 45 to 50 percent of second priority allotments. Winter water was stored behind

Walsh Dam, then released from April 12 to July 1. After haying there was no flow in Willow Creek at Walsh Dam; therefore, water for the lower users was diverted from Barron's lower reservoir down Eagle Lake Canal and returned to Willow Creek at Horse Lake Road.

Susan River. The available water supply in the Susan River was sufficient to satisfy all allotments in Schedule 6 (three priorities) until April 9. As the flow receded, Schedule 6 was terminated for the season. All allotments in Schedule 3 (three priorities - Lower Susan River) were satisfied until April 12. From mid-May throughout the remainder of the season there was enough water for about 50 percent of second priority allotments in this schedule. All allotments in Schedule 5 (three priorities - Upper Susan River Area) were satisfied until April 14. From June 1 to mid-June there was enough water for about 50 percent of second priority allotments in this schedule. From July 31 throughout the remainder of the season, water was available for 2 percent of second priority allotments.

Lassen Irrigation Company Reservoirs. The Susan River decree allows the Lassen Irrigation Company's McCoy Flat and Lake Leavitt Reservoirs to store surplus water during winter and spring months. Once filled, or if a shortage occurs among downstream water right owners, the natural flow in Susan River above McCoy Flat Reservoir must be released.

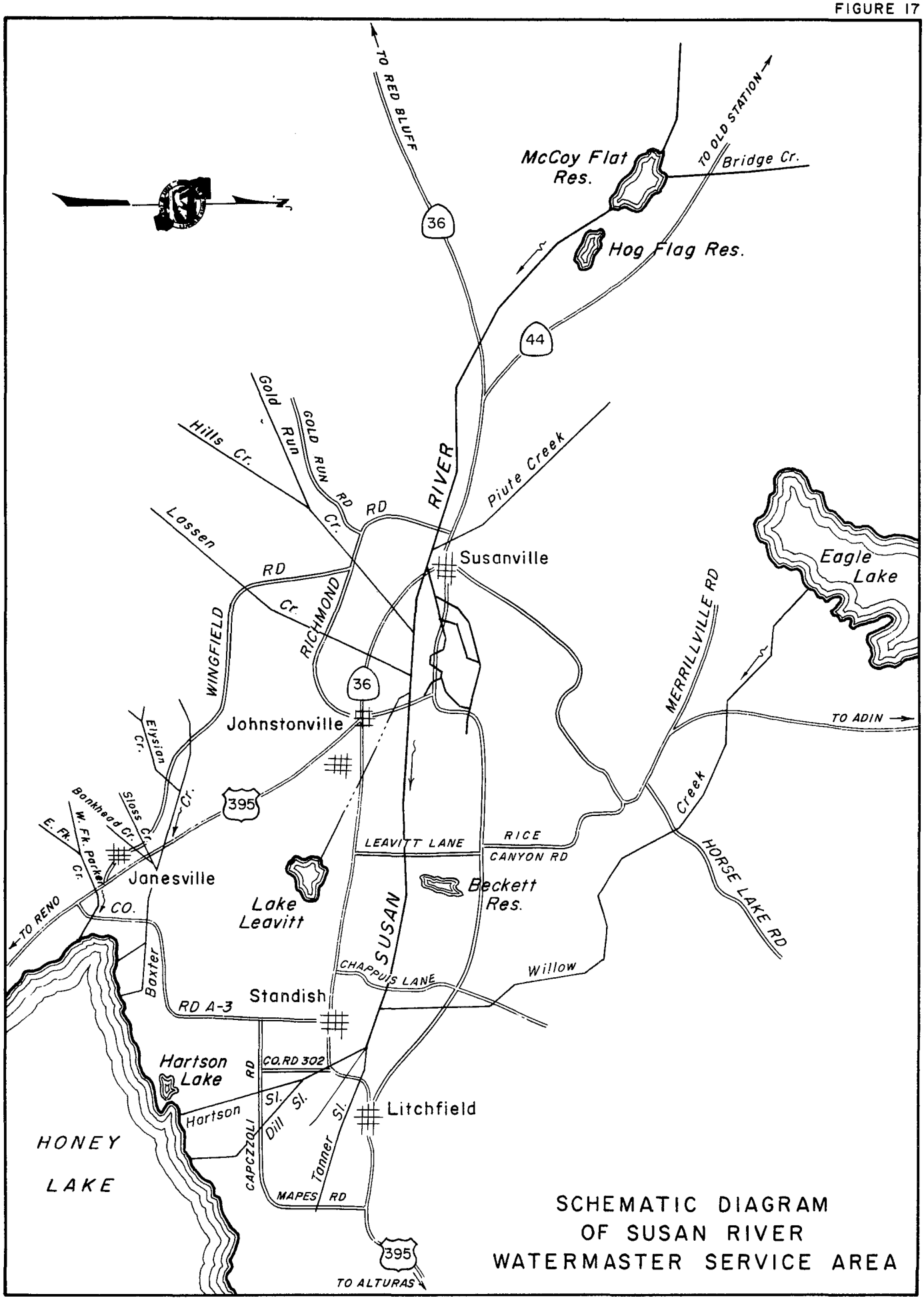
With a carryover from 1967, McCoy Flat Reservoir filled to within 0.6 foot of capacity during May. Lake Leavitt filled, as usual, and releases for irrigation water began on April 22. Lassen Irrigation Company lands received three complete irrigations during 1968; however, all of their reservoirs were empty by September 18.

Releases from Hog Flat Reservoir were required on May 1 for irrigating the Bentley Ranch out of the A and B Canal. The flow in the Susan River above Willow Creek fell below 20 cubic feet per second on May 20 which required a part of the inflow to McCoy Flat Reservoir to be released to the downstream users. Of the inflow to McCoy Flat Reservoir, 240 acre-feet in May, and all of the inflow during June was required for the downstream users.

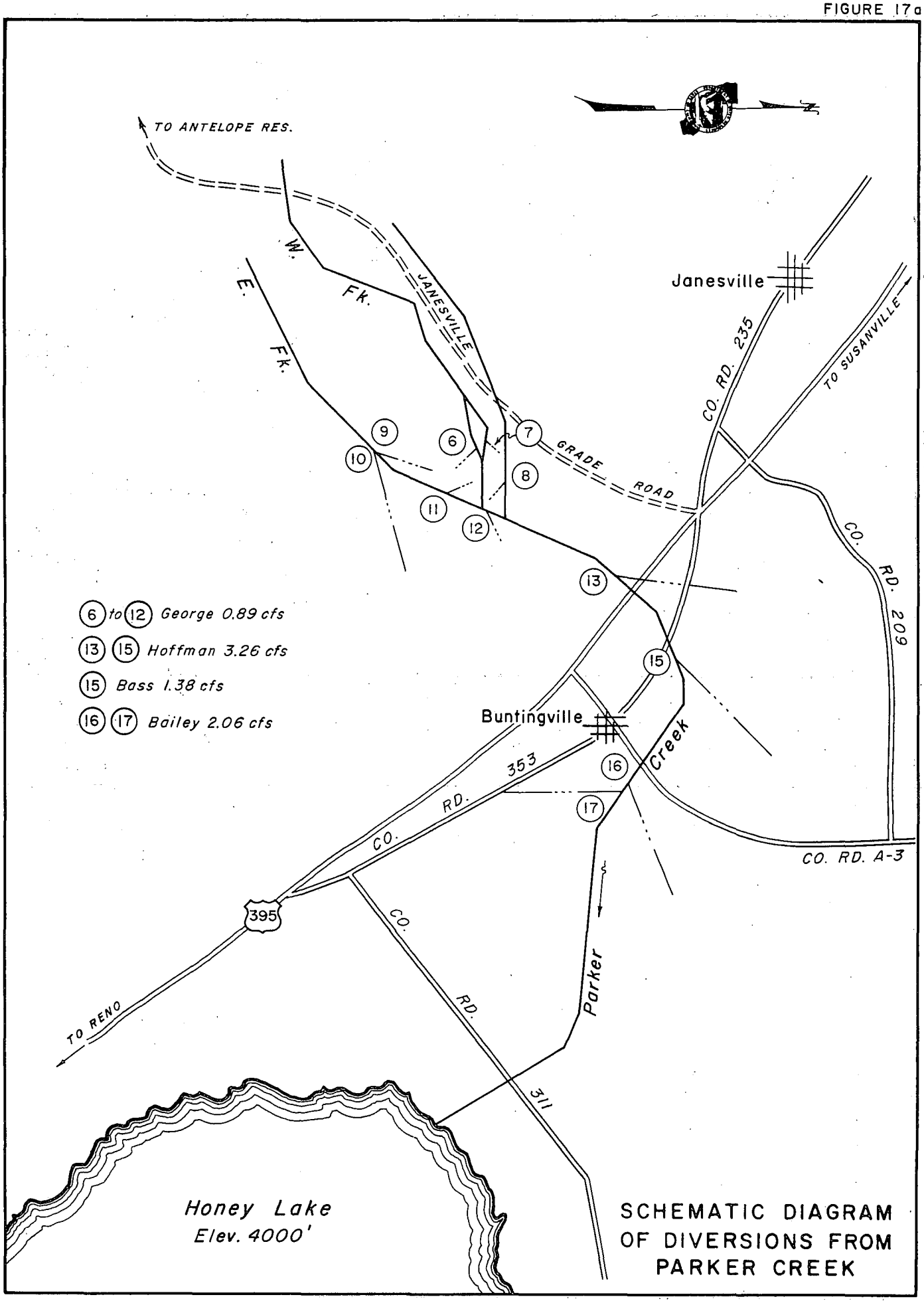
Special Occurrences

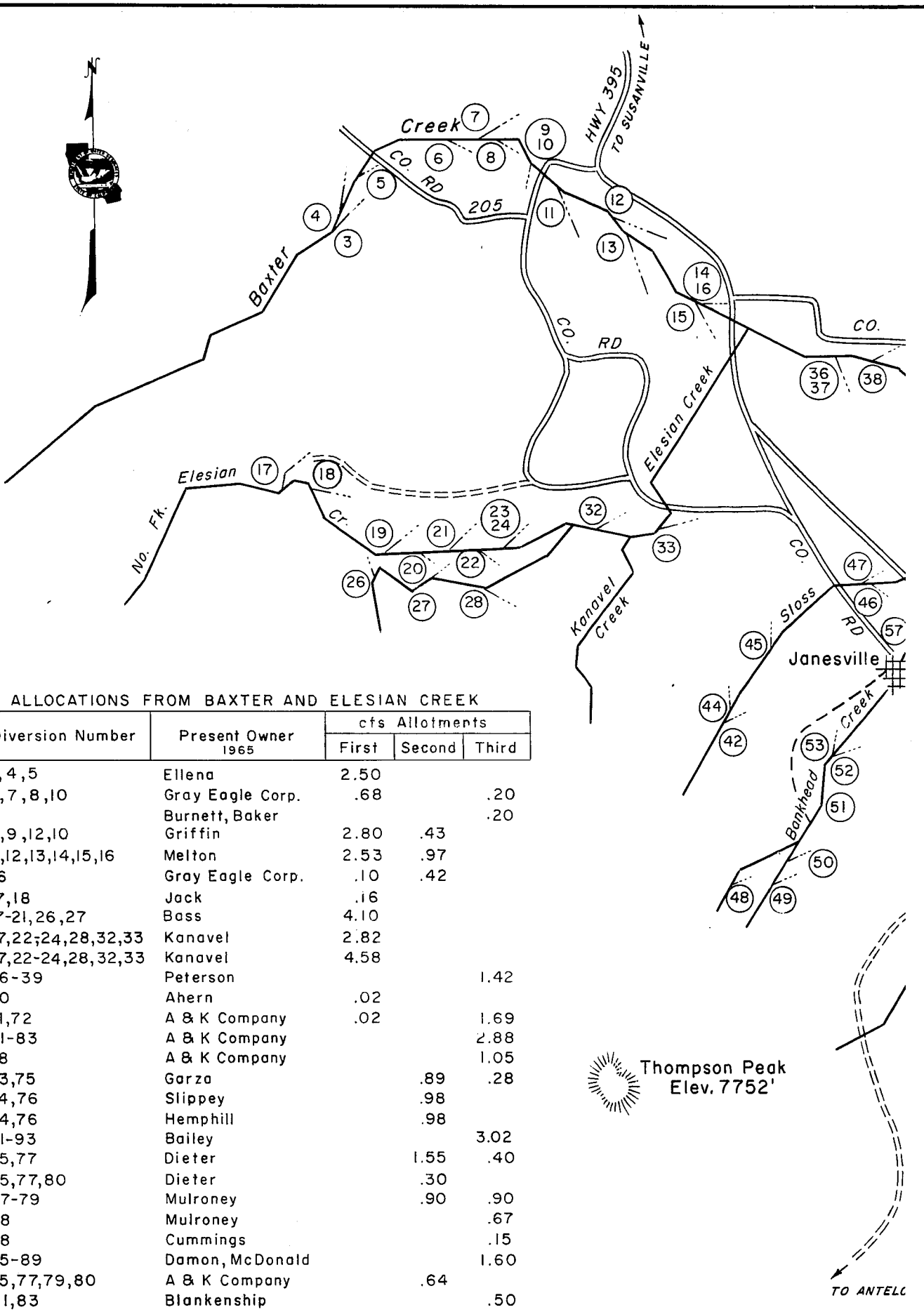
New weirs were installed at the head of the Flood Channel and at McClelland's upper diversion.

FIGURE 17



SCHEMATIC DIAGRAM
OF SUSAN RIVER
WATERMASTER SERVICE AREA


TO ANTELOPE RES.
W. Fk.
E. Fk.
JANESVILLE
Janesville
CO. RD. 235
TO SUSANVILLE
GRADE ROAD
6
7
8
9
10
11
12
13
15
16
17
CO. RD. 209
6 to 12 George 0.89 cfs
13 15 Hoffman 3.26 cfs
15 Bass 1.38 cfs
16 17 Bailey 2.06 cfs
Buntingville
Creek
CO. RD. 353
CO. RD. A-3
395
CO. RD. 311
Parker
TO RENO
Honey Lake
Elev. 4000'
SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
PARKER CREEK



ALLOCATIONS FROM BAXTER AND ELESIAN CREEK

Diversion Number	Present Owner 1965	cfs Allotments		
		First	Second	Third
3,4,5	Ellena	2.50		
6,7,8,10	Gray Eagle Corp.	.68		.20
11	Burnett, Baker			.20
8,9,12,10	Griffin	2.80	.43	
8,12,13,14,15,16	Melton	2.53	.97	
16	Gray Eagle Corp.	.10	.42	
17,18	Jack	.16		
17-21,26,27	Bass	4.10		
17,22;24,28,32,33	Kanavel	2.82		
17,22-24,28,32,33	Kanavel	4.58		
36-39	Peterson			1.42
70	Ahern	.02		
71,72	A & K Company	.02		1.69
81-83	A & K Company			2.88
78	A & K Company			1.05
73,75	Garza		.89	.28
74,76	Slippey		.98	
74,76	Hemphill		.98	
91-93	Bailey			3.02
75,77	Dieter		1.55	.40
75,77,80	Dieter		.30	
77-79	Mulroney		.90	.90
78	Mulroney			.67
78	Cummings			.15
85-89	Damon, McDonald			1.60
75,77,79,80	A & K Company		.64	
81,83	Blankenship			.50
84,90	Triami Cattle Co.			1.81

ALLOCATIONS FROM SLOSS AND BANKHEAD CREEKS

Diversion Number	Present Owner 1965	cfs Allotments			
		First	Second	Third	Total
42	Bowersox	.02			0.02
44	Thornton	.002			0.002
45	Spears			.08	0.08
46	Grover	.10	1.10		1.20
46,47	Peterson	.10	1.10		1.20
48,49,50	Row	.02	.13		0.15
51	Holmes Pipeline	.08		.11	0.19
52,53,55	Pyle			.48	0.48
56,62	Ashmore	.25	3.23		3.48
63,65	Thomasson	.05		.30	0.35
66,67	Fritts	.06		.20	0.26

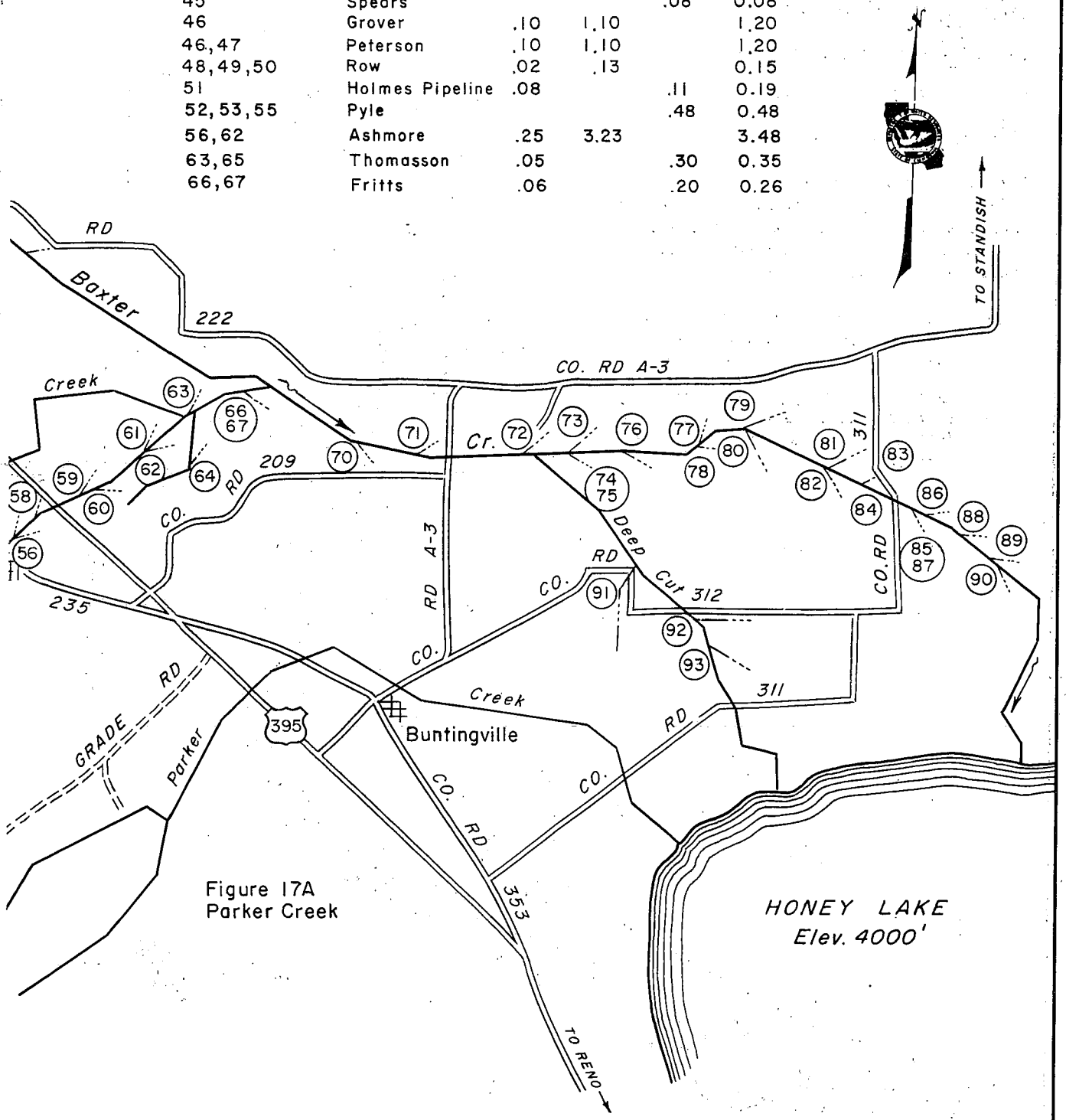


Figure 17A
Parker Creek

)PE RESERVOIR

SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
BAXTER CREEK

FIGURE 17c

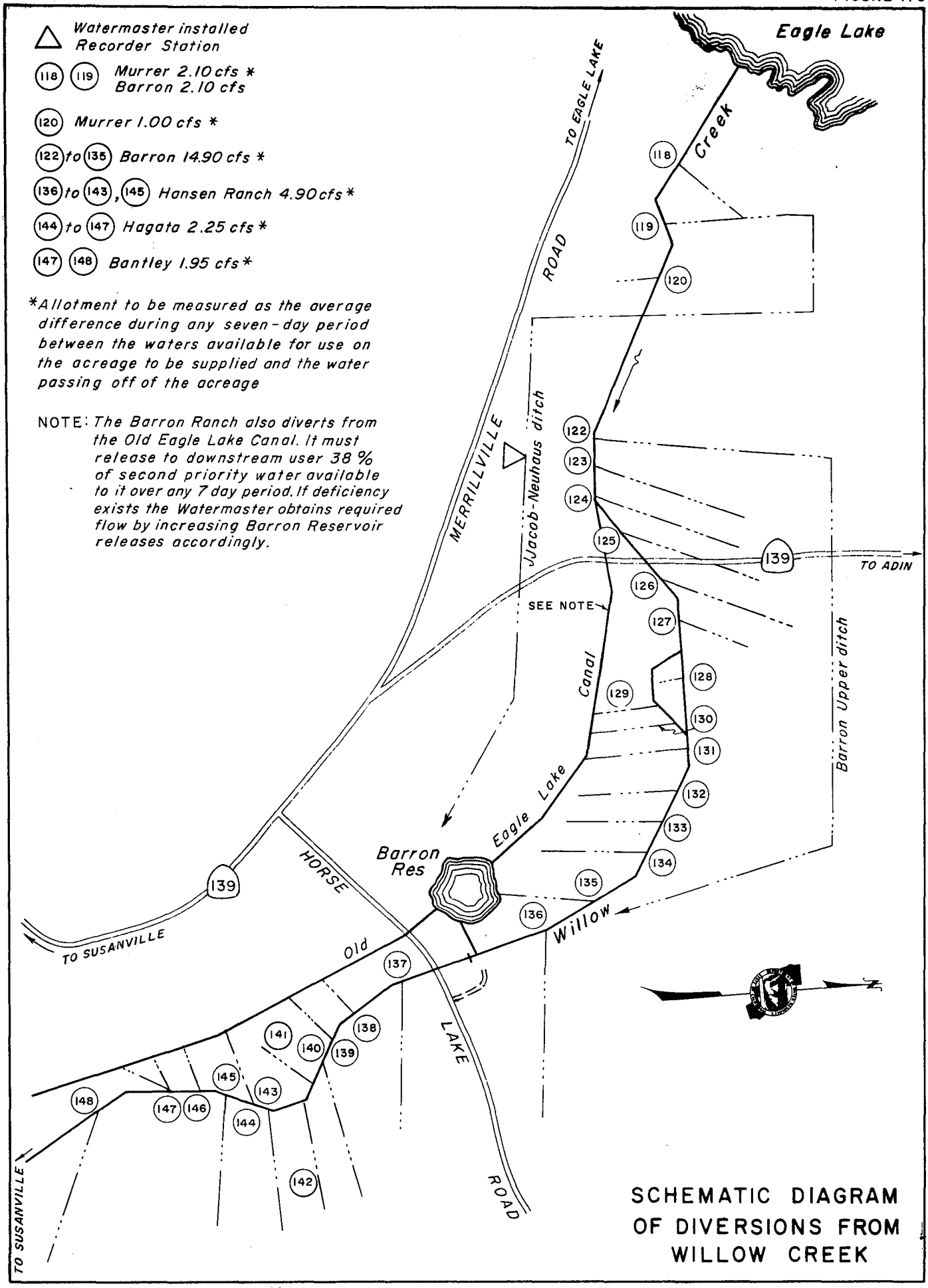
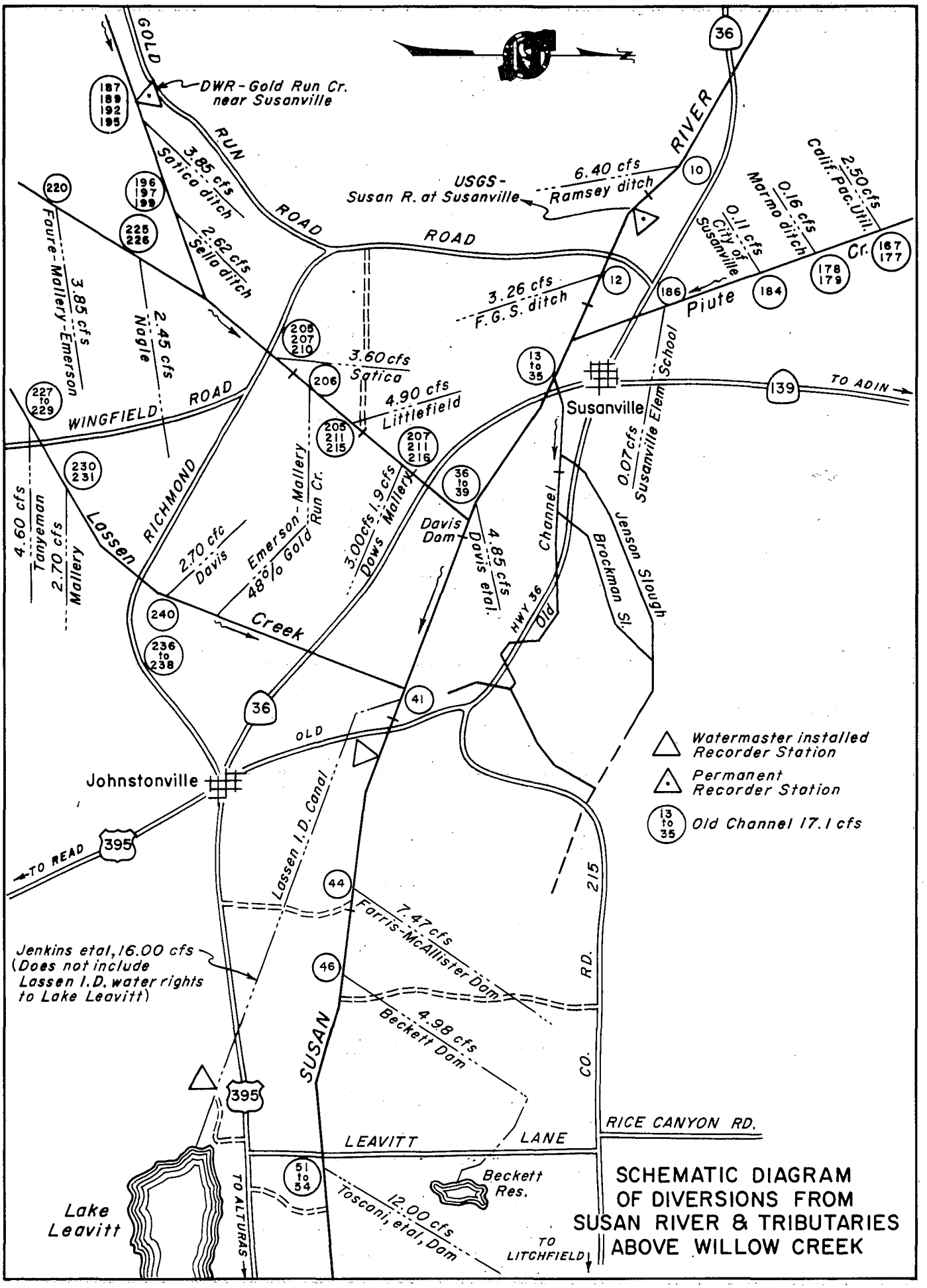

Watermaster installed Recorder Station
118 119 Murrer 2.10 cfs * Barron 2.10 cfs
120 Murrer 1.00 cfs *
122 to 135 Barron 14.90 cfs *
136 to 143, 145 Hansen Ranch 4.90 cfs *
144 to 147 Hagata 2.25 cfs *
147 148 Bantley 1.95 cfs *
*Allotment to be measured as the average difference during any seven-day period between the waters available for use on the acreage to be supplied and the water passing off of the acreage
NOTE: The Barron Ranch also diverts from the Old Eagle Lake Canal. It must release to downstream user 38 % of second priority water available to it over any 7 day period. If deficiency exists the Watermaster obtains required flow by increasing Barron Reservoir releases accordingly.
Eagle Lake
TO EAGLE LAKE
Creek
ROAD
MERRILLVILLE
Jacob-Neuhaus ditch
TO ADIN
SEE NOTE
Canal
Barron Upper ditch
Eagle Lake
Barron Res
HORSE
TO SUSANVILLE
Old
Willow
LAKE
ROAD
TO SUSANVILLE
SCHEMATIC DIAGRAM OF DIVERSIONS FROM WILLOW CREEK

FIGURE 17d



SCHEMATIC DIAGRAM OF DIVERSIONS FROM SUSAN RIVER & TRIBUTARIES ABOVE WILLOW CREEK

[3] = Schedule 3
[5] = Schedule 5
[6] = Schedule 6

(56), (94) to (96) Barry, Story, Fraley, Mendibourc, Wagner — 2.00 cfs [3]; 1.95 cfs [6]

(71), (75) to (78) McClelland — 2.67 cfs [3]; 7.33 cfs [5]; 0.75 cfs [6]

(57), (58), (69) Gibson — 2.00 cfs [3]; 5.50 cfs [5]

(58) to (61), (79), (80), (84) Mapes — 2.91 cfs [3]; 8.03 cfs [5]; 2.35 cfs [6]

(81) to (83) DeWitt — 0.33 cfs [3]; 0.92 cfs [5]; 0.50 cfs [6]

Theodore — 0.50 cfs [3]; 1.38 cfs [5]; 2.60 cfs [6]

(85), (86) Calif. Fish & Game — 3.33 cfs [3]; 9.17 cfs [5]; 6.70 cfs [6]

(82), (87) to (89), (91), (92) Capezzoli, DeWitt — 2.00 cfs [3]; 5.50 cfs [5]

(99) (102) Beckett — 2.30 cfs [3]; 5.50 cfs [5]; 5.15 cfs [6]

(98), (100), (101) Bailey — 1.33 cfs [3]; 3.67 cfs [5]

(97) Tanner — 1.33 cfs [3]; 3.67 cfs [5]

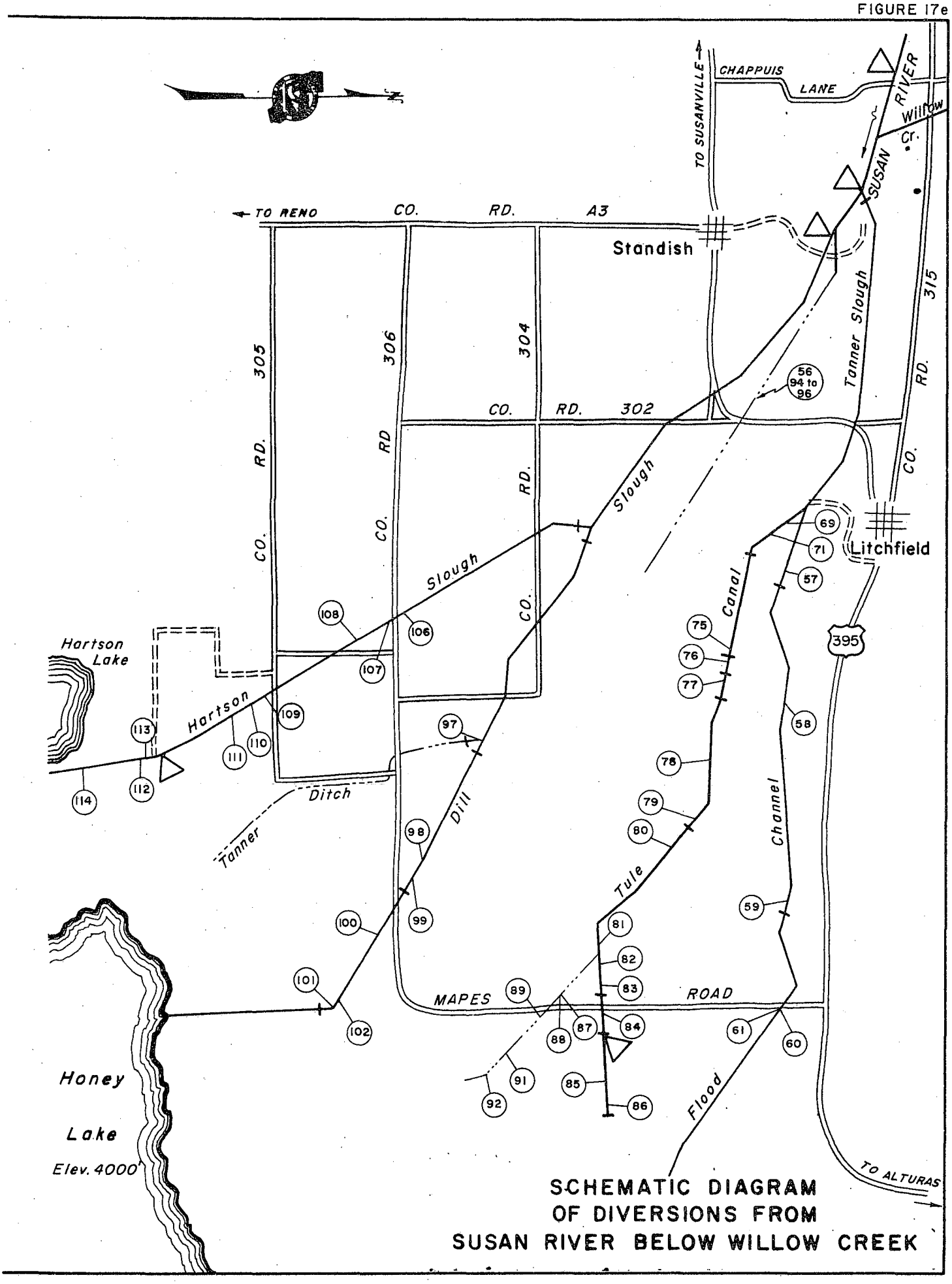
(106), (109) Buckner — 0.25 cfs [3]; 0.85 cfs [6]

(107), (108) Beckett — 0.25 cfs [3]; 0.95 cfs [6]

(110), (111) Anderson — 0.25 cfs [3]; 1.30 cfs [6]

(112) to (114) Calif. Fish & Game 3.10 cfs [6]

△ Watermaster installed Recorder Station



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
SUSAN RIVER BELOW WILLOW CREEK